# History of Humanity

## Volume VII

## The Twentieth Century

Edited by Sarvepalli Gopal
and Sergei L. Tikhvinsky

Co-edited by I. A. Abu-Lughod,
G. Weinberg, I. D. Thiam and W. Tao

# HISTORY
## OF
# HUMANITY

Scientific and Cultural Development

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In memory of Paulo E. de Berrêdo Carneiro,
President of the first International Commission
for a Scientific and Cultural History of Mankind
(1952–1969) and of the present Commission
from 1979 to 1982

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# PREFACE

*Koïchiro Matsuura*
*Director-General of UNESCO*

With the publication of this seventh and final volume of the *History of Humanity*, UNESCO has successfully completed one of its earliest and most ambitious projects: the publication of a universal work of international cooperation conceived to provide 'a wider understanding of the scientific and cultural aspects of the history of mankind and of the mutual interdependence of peoples and cultures and their contributions to the common heritage' (Resolution 5.7 of the UNESCO General Conference at its second session, November 1947).

It is worth emphasizing that this noble objective lies at the very heart of UNESCO's founding principles of 'advancing the mutual knowledge and understanding of peoples' and 'promoting the free flow of ideas and images' as stated in the Organization's Constitution.

The task of 'composing a universal history of the human mind from the varying stand-points of memory and thought that characterize the different contemporary cultures' was, indeed, a challenge for UNESCO. In the late 1960s – some twenty years after launching this prodigious editorial project – the First International Commission, in collaboration with a distinguished team of scholars from different countries and backgrounds, gave birth to the six-volume *History of the Scientific and Cultural Development of Mankind*. This work, which eventually appeared in six languages, received wide praise for the high quality of its contributions and the originality of its approach.

However, it is common knowledge that all historiography is 'work in progress' and, in the continuous flux of history, neither interpretations nor facts are set in stone. In fact, history itself has moved on, altering in the process the perspectives from which the past is viewed. It is therefore hardly surprising that, shortly after the completion of the first edition, both compilers and readers became aware of the need for extensive revision owing to a number of factors, particularly the astonishing advance of knowledge and achievements since the project's inception, but also the increasing demand for pluralism in historical approaches.

Moreover, many considered that this first edition still reflected, to a certain degree, the predominant Eurocentric vision characteristic of the period and that certain regions and countries, especially those that had achieved independence since the end of the Second World War, were not adequately represented.

In 1969, the President of the International Scientific Commission, the late Paulo E. de Berrêdo Carneiro, prophetically declared: 'The day will come when that which we have written ... will have to be replaced. I should like to think that our successors will attend to this, and that a revised version of these volumes may be published at the dawn of a new millennium'.

And just a decade later, that day came. In 1980, the Commission recommended to the General Conference that the new *History of the Scientific and Cultural Development of Mankind* should not be merely a revision, but rather a radical revamping of its predecessor. Thus, the new edition – later renamed the *History of the Scientific and Cultural Development of Humanity* and commonly referred to as the *History of Humanity* – would reflect new developments in historical methodology and recent findings of historical research in all fields of study (especially emerging disciplines), while presenting a broad and balanced picture of the different world cultures without imposing any one philosophy of history or proposing any particular civilization or period as a paradigm.

With a view to responding to the demand for a decentralization of historical viewpoints and interpretations and complementing the *History of Humanity* collection, UNESCO also decided to undertake a series of regional histories reflecting the perspective of the populations concerned and published in several languages to reach the widest possible readership. Among the series are the six-volume *General History of the Caribbean*, the six-volume *History of the Civilizations of Central Asia*, and the *General History of Africa*, comprising eight volumes and also published in several African languages including Hausa, Kiswahili and Fulani. The completion of the latter series in 1999 saw the commencement of a second phase intended to extend the dissemination of this work to the greatest number of readers and particularly Africans. Meanwhile, the international editorial teams continue their work on the two other regional histories: the *General History of Latin America* (eight of the nine volumes have been published to

date) and *The Different Aspects of Islamic Culture* (three of the six volumes have been published so far).

This new approach to presenting the history of the development of humankind is consistent with UNESCO's ongoing commitment to enhancing awareness of cultural diversity and promoting pluralism in cultural exchanges. These ambitious goals have become even more urgent in light of the dizzying pace of globalization in recent times. As reaffirmed by UNESCO's Universal Declaration on Cultural Diversity, adopted by its General Conference in 2001, 'cultural diversity is an ethical imperative inseparable from respect for human dignity'.

The construction of true cultural pluralism first requires the abandonment of prejudices and the rise of a shared culture based on the acceptance of diversity. I am confident that the *History of Humanity* will contribute towards the realization of these noble objectives by fostering intercultural understanding and reinforcing the central notion of unity within the diversity of the human family and the interconnectedness of progress and development in all parts of the world.

Today, more than 25 years after the decision to create a new *History of Humanity*, I am very proud to present this completed second edition, which has greatly expanded upon the pioneering work of those dedicated scholars responsible for the first edition. I should like in particular to express my admiration of and deep gratitude to the members of the Second International Commission and to the 540 distinguished specialists from all geocultural backgrounds working in some 85 countries who have contributed to this historic undertaking. A project of this magnitude and complexity inevitably encounters its share of hurdles in the form of delays, painstaking revisions, etc. However, the intellectual integrity and unwavering dedication and patience of all those involved in this extraordinary exercise in international and intercultural collaboration have enabled us to weather the storm and achieve our objective.

I am sure that readers will make known their own views in the years to come. Of course, the Commission is well aware that given the time it took to complete the project and the ever-increasing pace of scientific research, the present edition might fail to take into account some of the latest findings in certain fields. Such shortcomings are inevitable.

Nevertheless, in committing this work to their scrutiny, UNESCO and the International Commission are taking the final step in the task entrusted to them by the community of Member States represented at the General Conference. It is my firm belief that each of us stands to benefit from this great testimony to our common past and act of faith in our shared future.

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# FOREWORD

*Charles Morazé*
*former President of the International Commission*

Among the great tasks assigned to UNESCO by the Constitution is the duty to promote and encourage mutual knowledge and understanding throughout the world. While many of the divergences that divide people date from a distant past, an analysis of their historical antecedents discloses links which draw them nearer to one another, brings light to their contributions to a common patrimony of humanity, reveals the ebb and flow of cultural exchanges and emphasizes their increasing tendency to become integrated into an international community.

So wrote Paulo E. de Berrêdo Carneiro, president of the International Commission (1952–69) in the opening paragraph of the preface to the *History of the Scientific and Cultural Development of Mankind* in 1963. Today, it would be difficult to say anything about humanity's 'increasing tendency to become integrated into an international community', unless an attempt were made to assess the outcome of this 'tendency' as reflected in the current state of the world. Today, few events remain local. Information on any major or minor occurrence is communicated to seemingly almost everyone immediately, and an action undertaken in one part of the world inevitably has global repercussions. Those who experience this 'planetarization' sense the 'integration' of all human beings into an international community less as a 'tendency' than as a *fait accompli*. But what about the vast excluded majority of people, who pose the question in completely different terms. What they seem to ask is: can a 'common patrimony of humanity' be achieved solely through an integration based on scientific and technical developments? What then can we do to ensure an equal access to such means for all, when the more fundamental task of reducing existing differences in the very standards of living lags far behind?

The idea of writing a history of the development of humankind was first put forward by Julian Huxley, the executive secretary of the Preparatory Commission of UNESCO. In 1946, Huxley wrote that 'the chief task before the Humanities today would seem to be to help in constructing a history of the development of the human mind, notably in its highest cultural achievements'. He underscored the major role that historians would play in the realization of what he called a 'gigantic enterprise'. Huxley later outlined a project that was to be submitted to the future UNESCO. In 1950, in accordance with the resolution passed by the General Conference of UNESCO, an International Commission was set up and the publication of a *History of the Scientific and Cultural Development of Mankind* (in six volumes) was approved. The first volume appeared in 1963.

How was this 'gigantic enterprise', conceived by Huxley, judged? In most cases, the volumes were not well received by critics. They did not question the data included. Rather, they mainly objected to the criteria for the selection of data and the interpretations advanced. Yet a closer look at these criticisms revealed that, skilled as they were at pointing out certain flaws and misconceptions, these commentators hardly proposed concrete suggestions that would improve the work in the future. On the whole, however, we were left with the impression that, notwithstanding its shortcomings, a very large number of readers found the work commendable, particularly as a first step towards achieving an 'essential task'.

No elucidation – rational or otherwise – of the origins or the evolution of humankind can be offered once and for all, as if by divine revelation. Writing a history of the development of humankind necessarily constitutes an undertaking that one has to return to over and over again. Nearly thirty years passed before UNESCO decided to resume an enterprise that could by no means be regarded as finished. Requested by the new Member States, a recasting of the first edition deserved the wholehearted support of all those who helped establish the Organization. The changes that had taken place since the project's inception rendered necessary and amply justified a revision and re-evaluation of history, and the members of the International Commission were the first to acknowledge such a need. There were, of course, other and more imperative reasons. Two of these should be pointed out here.

The first concerns developments in the area of research methodology. Since the 1960s, historical knowledge has increased considerably and has turned from factual history to a greater interest in anthropological research. The added

insight offered by present studies – however imperfect they may be – deserves to be transmitted to a larger public. The second and perhaps less obvious reason derives from the role that the writing of history can, and should, play in increasing our level of awareness. Writing, or as in the present case, rewriting the history of human scientific and cultural evolution requires not only taking stock of the new data available, but also helping to evaluate and assess the various implications – positive as well as negative – of all changes that have occurred. Justifying science in the name of all its benefits and advantages amounts to refusing to accept the damaging effects it can have. We have gradually become accustomed to the presence of many latent nuclear volcanoes without compensating for the technological risks. Not enough has been done to counterbalance the excessive monetary investments needed to build up such arsenals with sufficient funds to help confront the problems afflicting certain segments of humanity. Technological development has also begun to seriously endanger animal and plant life on our planet. Factors such as these remind us of the need for greater vigilance.

Universal histories and histories of the world abound. So many have been published and continue to be published that one could question the need to produce yet another one. No doubt many readers will be surprised at this venture. Each in his own way will of course judge the relative value of this new edition. There is, however, one major difference: other works of history enjoy a certain freedom that has in a sense been denied to the present one. They are free to choose themes, periods and regions that best suit the demands of a particular readership and a specific conception of history. Such works can thereby claim a certain cohesiveness, which also helps establish a certain uniformity of expression and style. The present work has been founded on an entirely different principle: the greatest possible diversity. This diversity proved to be, on the one hand, so great that it is difficult to stop it from becoming disparate and, on the other hand, not great enough to allow for a convenient regrouping of elements into types. The fault lies not in the venture itself or in those who took up the task. It lies mainly in the present state of historical knowledge. The analytic nature of historical research today blocks the way to synthesis and to the kind of approach required in the writing of history that can be considered truly universal.

This work can serve only as a history of the world and not as a universal history. This, of course, is already a considerable achievement. We should not count on the diffusion of universalism, which is the subject of inquiry by a very small, privileged minority, as long as all cultures are not equally represented and historians from all parts of the world are not endowed with the same means and cannot claim the same status, social and otherwise.

Not claiming to attain the unattainable does not, however, mean renunciation. The roads to universalism are full of twists and turns. But, they all lead to the same destination; one history for one united world. Since this history could not reach the highest common factor, it had to tend towards the lowest common multiple. And in this respect, the present work has not failed in its mission.

In 1950, we elaborated in three days a plan that would take eighteen years to complete. With a view to ensuring unity of style and presentation, we decided that each of the six volumes should be written by a single author. Such ideas

had to be abandoned. Some thirty years later, the New Commission decided to take more time over the distribution of the work to be included in seven, rather than six, volumes. Moreover, each volume would be coordinated with the others and as many authors as necessary would be called upon to cover a wide range of fields. The selection of the criteria on which the new history would be based first led to a detailed examination of the comments made by the readers of the first edition. After much debate, all agreed that it would not be satisfactory to simply juxtapose a series of regional histories. One of two possible solutions had to be chosen: dividing history either into themes or into periods and analysing each according to themes and regions. The first option – an idea that had already been put forward before 1948 – would perhaps have helped bring out in a more significant manner the factors that render manifest the common destiny of humankind. But the state of historical research at that time, which in most cases and owing to an ever-increasing acquisition of skills proceeded in the form of temporal as well as regional specializations, constituted a real obstacle to the realization of such a scheme. It was therefore decided that each of the seven volumes would be devoted to a single period and would contain a thematic and regional section.

Yielding to the constraints imposed by the state of knowledge and research did not, however, solve all problems. The idea of splitting the past into defined periods pleased no one, since most historians tend to view it as an organic whole. But, taking everything into consideration, had the objective been to separate one cultural component from another or, for example, the physical from the cultural or the religious from the profane, this act of surgery would have turned into an exercise in vivisection. Opting for the lesser evil, the Commission thus decided to proceed by chronological sections. This, at least, allowed for the preservation of a certain unity within each group.

Already in the 1950s, it had become evident that the form of periodization upheld by the European tradition loses its meaning when applied to the other parts of the world. Terms such as 'antiquity', 'the Middle Ages' or 'modern times' have little significance insofar as Asia is concerned, and perhaps even less for Africa. Admittedly, we continue using such terms for the sake of convenience. We cannot totally discard them, but we should try at least not to trust them fully.

The importance of each period is measured more in terms of what humankind has contributed to each than in terms of a duration defined by astronomy. The 'Great Discoveries' of the sixteenth and the seventeenth centuries led to some spectacular changes in the history of the world. A sudden growth of ideas and of commercial capitalism accompanied by or resulting from military conquest gave rise to migrations that brought about the creation of a new map of the world and new conceptions of humanity's destiny. This moment marks a turning point that we have ever since perceived as an acceleration of history. It was, therefore, decided that three volumes of the present work would be devoted to the period following these significant changes and transformations, while four volumes would cover the entire preceding period, starting from the origins of humankind and leading up to the sixteenth century. The Commission also decided to devote an increasing number of pages to recent years. The fifth volume thus covers three centuries; the sixth, one and a half, while the seventh spans a single century.

A word of caution is, however, in order. We often make use of a concept of progress that is based on the quantitative and not the qualitative value of achievements. Manufactured goods, consumer items and exchanges, whether they concern concrete objects or ideas, can be more or less quantified. But, as we do not posses any means of measuring happiness or well-being, we cannot infer from this that the quantitative and the qualitative value of this progress is the same, particularly insofar as the world in general is concerned. Moreover, this notion of progress should not hinder a proper appraisal of all that was contributed to history by our ancestors, to whom we owe our existence and our way of living.

Great care was taken to avoid placing undue emphasis on what could be considered the European landmarks of history. The years 1789 and 1914, although highly significant in the history of Europe, served only nominally as points of reference. It was understood that, depending on the case, the ethnocentrism implied by these dates would be reduced as much as necessary through a proper and adequate treatment of the issues preceding or following them. Similarly, to avoid falling into the traps of Western traditionalism, it was considered necessary to cease using the Christianization of the Roman Empire as a mark of the end of the Ancient World and the beginning of the Hegira, in the third volume, which covers the period from 700 BC to AD 700 , the middle of which comes before the beginning of the era acknowledged – belatedly – also by Muslims.

The Commission's choice does not conflict greatly with the Chinese system of dating, because around the same epoch the same phenomenon appeared in both the east and west of Eurasia: the awakening of tribes in these Central-Asian steppes, who until then had been restricted to a disorderly, Brownian form of movement of particular groups, and who henceforth united and set off to conquer the largest empire the world has ever known. Events such as this draw our attention to the advantages of following a calendar determined not by the permanent aspects of the planets but by climatic variations. Indeed, the Mongols would not have reached such a degree of power had the climate not favoured the humidification of the pasturelands that nourished their horses. However, it will be a while before a calendar based on climatic variations is available. We still lack information on some vital factors: the evaluation of harvests, the extension or the regression of lacustrine and forest areas, phytographical analyses, and so on. Only when we have obtained such necessary data can we think of establishing a new type of periodization that can be verified through meteorological calculations extrapolating and applying to the past our present conjectures about the influence of solar explosions on the atmosphere.

The period to be treated in Volume IV was therefore set by the end of Volume III (the seventh century AD) and the beginning (the sixteenth century AD) of Volume V. Volumes I and II have been devoted to the many thousands of years constituting the origins of humanity. The richness of the new data at our disposal made it necessary to treat separately the period extending from the third millennium to the beginning of the seventh century BC.

The division into seven volumes was dictated by a combination of factors ranging from the abstract to the practical – including ensuring the more or less equal size of the volumes – in keeping with historical facts. Beyond all specific differences, five principal stages can be recorded in human evolution: (1) the use of materials and tools accompanied by the emergence of cultures; (2) the moulding of a geopolitics or a geo-culture signalled by the appearance of major works of all kinds, all of which were to be of lasting value; (3) partitive convulsions that forced in advance the distinction of cultural identities through the play of mutual influences; (4) conceptions resulting from a closed human universe whose planetary course lies within a limitless space; and (5) the intensification of centres of development under the pressure of a form of capitalism that has become industrial and an industry that is becoming scientific. The seventh volume will thus deal with the issue of these new currents and the tidal waves that they provoke: facets that lead to the birth of a new type of polarization and as a result of which traditional cultures fall into abeyance.

Such bird's-eye views as those offered here are not misleading because they are crude; they seem questionable because they escape our sight when we remain too close to the ordinary facts, and in this regard we mainly confront the limitations of our methods of research. No one is unaware of the difficulties inherent in all attempts to provide a synthetic view of humankind's common destiny. There is no answer to these difficulties from which the present subdivision of each volume into themes and regions suffers – into themes that highlight the shared characteristics of all human beings, and into regions to underline human diversity.

In each volume, the thematic parts should have been the easiest to work out. Several problems were, however, encountered. In order to ensure that the cultures that benefit from the spectacular development we witness today were not favoured beyond measure, it was considered necessary to reduce the importance granted to theoretical innovations and their applications and therefore to refrain from using scientific discoveries as chronological pointers. Had this not been the case, the distribution of themes would have been a simple matter. It would have sufficed to begin with a survey of the scientific and technical knowledge acquired over a given period of time, and then to retrace the causes in their sequential order.

Just as it was necessary to tone down the privileges conferred on some by the process of evolution – and, more particularly, to question a system of values rooted in an overly univocal notion of progress – it also was necessary to standardize the distribution of themes by including more 'ordinary' references: for example, by starting with a description of the physical and natural conditions in order to arrive at the scientific through the demographic and the cultural. This not only enhanced the uniformity of the volumes but also offered the major advantage of emphasizing ways of living. Whatever these are, they must first satisfy the basic physiological needs – a vital minimum dictated by the instincts of survival and rendered partially relative by the differences of climate. Each culture responds to this in its own manner, and accords as much to its natural environment as to the habits that it inherits. Certain acquired needs are then added to this vital minimum – superfluous needs become necessary and established in varying degree according to the social hierarchies and geohistorical differences. Moreover, as human beings are not only biological but also thinking and feeling entities, each material culture is accompanied by a culture that can be called 'spiritual' in the widest sense of the term, and that also varies according to the situation. Finally, even though

the conditions are not identical, material culture and spiritual culture are interrelated.

This enunciation of the common grounds on which all human lives are established stands to reason and would seem evident to any lay person. It could also, however, lead us to think that it is easy to find historians ready to develop each theme. The present state of historical knowledge proves that this is not so and, as always, for the same reason. Insignificant as this problem may be, the solution lies in abandoning analytical methods and adopting a synthetical approach.

Undoubtedly, current research and investigations help us in our evaluation of material and spiritual cultures, but separately. We are completely ignorant about the interconnections between the two. Where does this notorious deficiency come from? Two main causes can be advanced.

The first concerns the elaboration of a global history. Indeed, when it comes to local or regional histories, each confined to a particular epoch, the data we possess helps us either to deal with some of the problems or to contribute by offering some information. But when one problem or another needs to be looked at from a global point of view, we confront a major dilemma: which elements of the available data should be included in an inventory of an absolutely common heritage? In other words, which advances made at one place or another, or at one point of time or another, effectively contributed to what can be called 'general progress'? The workshops of historians can boast of few (if any) historians who specialize in the evaluation of 'generalities'! When the need for one arises, then it must be admitted that the courageous few who undertake such a task suffer from the absence of sufficient information and are compelled to work in conditions that make their achievements all the more admirable but considerably curb their influence.

This first cause leads to the second: the absence of criteria that would make it possible to distinguish effectively the subjective from the objective, as much in the work accomplished as in the reputations won. Here we touch upon an issue that is too important to dismiss without further discussion.

Studies on primitive or savage societies, particularly those conducted since the mid-twentieth century, carried anthropology to a high degree of what must be called the 'intelligence' of cultures. In these societies, myth plays a fundamental role. It legitimizes matrimonial and social behaviour as well as customs and ways of living – the way one eats, dresses and organizes one's life inside and outside the dwelling. In an even more significant manner, it legitimizes one's spiritual behaviour as much in times of war as in peace. This global aspect of myth itself leads us to the heights from which, at a glance, we can view not only the various behaviours as a whole, but also the very logic that sustains them.

Historical evolution disperses myth, without, however, abolishing the mythological function. It provokes the growth of branches and favours ramifications. What had developed thanks to myth, religion and literature (moral and political), art and technique breaks up later into more and more subdivided areas of knowledge: differentiations that lead to the belief that the logic of myth or of the sacred is challenged by that of 'Science', a word that obstructs more than all others what we term historical intelligence. In the

original sense of the word, 'science' means knowledge, with no distinction implied between knowledge and know-how. Today this word has taken on such a specific meaning that, for a vast majority of the most highly informed minds, science denotes truth, as opposed to the falsity of myth. Yet, many eminent scholars acknowledge that this 'truth' contains a part of myth and that it is indeed thanks to this that methods and knowledge advance. It is by working within the mythological that we reduce the part of myths, elements of which always survive in the very heart of science.

The barriers that have been most resolutely built against the 'intelligence' of history have their sources in the gradual formation of separate enclaves of investigation. Social, economic, political, literary history and so on – each domain follows its worn path and rarely meets the other, or never enough to allow for the establishment of criteria common to all that could constitute the basis for a truly universal history of scientific and cultural development. The worst form of such separation can be found in the cosmic distance that has been introduced between the history of religion and that of science, and this in spite of some highly remarkable, though rare, attempts to make them move towards each other via the social and the philosophical domains. No significant results should be expected until the gaps between ordinary language and scientific language are bridged, particularly when the latter makes use of mathematical terms so fully exploited by the initiated few and so inaccessible to the secular masses.

This brings us back to the question of the limitations of this edition referred to earlier: limitations concerning the basic logical presuppositions on which a truly universal history of humankind should be founded. It is only on the basis of certain common features that one culture can comprehend something that is part of another culture and that the people of today can understand a little of what lies in the past. But then, given the present state of our knowledge and the manner in which the basic logical presuppositions are handled, our history will remain beyond the reach of the general public – however enlightened – for which it is intended.

Nonetheless, a certain merit – perhaps less significant than hoped for – makes this second edition worthy of our attention. By eliminating the notion that the cultures rendered marginal by 'progress' represent groups of people 'without history', the study of cultures wherein myth is dispersed among all kinds of domains could only gain from the experience of those whose lives are, even today, steeped in a mythology that they all consider fundamental. We have not yet reached our goal, but the step taken marks a definite improvement in terms of our understanding of history. And, as readers will discover, it is this aspect of the thematic part of each volume that makes this work truly exceptional.

We now come to the question of the treatment of regions in each volume. To begin with, let us look at a major ambiguity that threatened the very conception of these sections. An example will suffice. To which region does Newton belong? To Cambridge? England? Europe? The West? The world? There is no doubt that the universality of his law of gravitation makes him a part of the common heritage of humanity. Yet, undoubtedly this law discovered by a particular man, at a particular place and point of time, would seem to have miraculously descended from the skies if we did not take into account the facts of the discovery, the

circumstances leading to it and the manner in which the law was adopted by all. Should we have then talked about Newton in one way in the thematic chapter and in another in the regional? Although the difficulties involved in solving such a problem are great, they turn out to be less so when confronted with yet another problem that would have resulted from any attempt to merge the two parts into one; for, in that case, the question would have been, 'which one?' A fusion of all into the regional would, to a great extent, have simplified the task, given that we are dealing with specializations in different fields. But it would have led to the very unpleasant need to emphasize the merits of one culture at the cost of the others. A fusion of all into the thematic? In that case, Newton's law would have been stripped of its socio-cultural characteristics and this would have led to some kind of sanctification of the 'genius'. Needless to say, our observations concerning Newton apply to all thinkers and discoverers and to all that humankind has created.

Some readers will perhaps regret the fact that this history, whose dominant note is certainly transcultural, does not succeed better in overcoming certain problems resulting from habits and preconceived notions. We all talk about 'Asia' and 'Europe'. Originally, these were names given to Greek nymphs and, together with Africa, were used to distinguish the three principal, cardinal points of the world perceived by the Mediterranean navigators: the east, the north and the, south respectively. As for the continent of America, its name was curiously given to it by a cartographer who, while outlining a map of this continent, used the information supplied to him by Amerigo Vespucci. In the case of the nymphs as well as in that of the cartographer, we can no longer distinguish the subjective from the objective. What was in fact a very subjective decision in the first place now appears to be very objective because it is commonly accepted by everyone. We cannot change something that has been so firmly established over the years, but the often very serious problems and disadvantages that result from the ethnocentrism implied by such customs need to be pointed out.

Depending on the epochs, Egypt is at times best understood when considered as African and at others when its civilization is regarded as having acquired much of its significance from a dual Nile-Euphrates identity. Similarly, instead of remaining Mediterranean, southern Europe became continental when the centre of gravity of exchanges and developments shifted to the Atlantic. China constitutes another example. This Middle Kingdom felt the effects of the existence of other continental regions when its Great Wall no longer protected it from the conquerors it later tried to assimilate, or when it yielded perhaps for too long a period, to the attack of the seamen and naval forces coming from the other end of the world, that is, from Europe.

Geographical perspectives change from one era to another. But it is difficult to incorporate such changes and align them with the periodization adopted for a publication devoted to history. Those responsible for planning the seven volumes had to devise the ways and means of solving such problems. At times, they had to resort to certain subterfuges so as to prevent the periodization from turning into some kind of a jigsaw puzzle and requiring frequent rearrangement. This entailed, however, the risk of introducing certain anachronisms.

Such risks are in no way negligible. To a modern mind, for example, the commerce or the conquests in ancient times across the deserts of Sinai appear as manifestations of the hostilities existing between Africa and Asia. This distinction between the two continents becomes nonsensical when applied to the period when Egypt did not consider itself as African, Assyrian or Asian. Each region perceived itself first as constituting the whole universe or as representing the whole universe as defined by its own gods. We must be aware of the dangers of accepting such ideas, which still survive in the unconscious, for they may affect our conscious minds and foster notions of rights and privileges detrimental to the development of universalism.

The need to determine the number of pages to be devoted to each 'contingent' arose from certain customs that, although anachronistic, sometimes generate very strong opinions and influence our decision. It also arose from the fact that the distrust of ethnocentrism expressed itself in terms that were very ethnocentric. Including Cro-Magnon man in an inventory of 'European' sites amounts to attributing to him a label that contradicts all that was felt in times when existence could not be conceived of except in terms very different from those related to our planetary territoriality. Similarly, the concept of Africa was itself foreign to the African empires of kingdoms, each constituting for itself a world in itself and, at the same time, a work that belongs to all. Readers will understand such imperfections, which have resulted from a need to adopt a pragmatic approach.

Applying modern notions of geography to any period of the past relieves us of the dizziness felt when we look down into the immense depths of time, yet it is in these depths that cultural but also natural interactions, direct or indirect, multiplied: a swarming mass much too indecipherable to allow for the delineation of linear ancestry. Physical evolution leads perhaps to the formation of races, but as the human species can be known through its customs, faculties and cerebral activities, this privilege common to all reduces practically to nothing the particularisms that some – not always disinterested – viewpoints defined formerly as racial.

The human species cannot really be differentiated except as ethnic groups and through customs that defy any simplistic typology. A strong capacity for adaptation, peculiar to humans, enables them to invent a practically limitless number of solutions to the problems posed by all kinds of environments, and even more so by circumstances that the smallest events modify and great events transform altogether. In this lies the most amazing aspect of history: the infinite variety of answers that each individual or collectivity finds to the questions put to it by destiny. The more history accelerates its pace and becomes more specific, the more our destiny becomes enigmatic. This is because every human being is a human being, and no single one resembles another.

The demise of the colonialists who believed or claimed to be the civilizers of this world led to the birth of many new nations and many new member states of international organizations. 'New' in what sense? The establishment of a 'new World Order' is bound to remain a utopian idea as long as history has not explained how a local body of historical cultures finally engendered what it has over the centuries referred to as 'civilization': a world full of contradictions. Intended as universal and respectful to other cultures, this civilization has turned out to be materialist and destroyed many cultures as a result of the superiority

that it attributed to its own system of laws and rights. Two challenging tasks thus face historians: acknowledging the universalism that lies hidden beneath all particularisms and agreeing among themselves on what should be made generally known in this respect.

An elucidation of the past requires personal as well as collective efforts. This twofold process should have found spontaneous expression in a work meant to aid the advancement of knowledge. The Commission recommended therefore that, in addition to the thematic and regional parts, a third part be added that would have comprised specific supplements on details that needed developing, problems that needed solving, and finally a presentation of different and opposing opinions on interpretations in dispute. This project met with overwhelming difficulties, and some explanation is called for.

This international history, which had been conceived as a result of dialogues and discussions, would evidently have gained considerably from a presentation of the differences in interpretation in their proper dimensions. It would have been more lively and instructive and have given readers more food for thought. Unfortunately, the dispersion of authors to be included and chosen from the whole world demanded means and time that were unavailable. The editors, who had already undertaken a tremendous amount of work, could not have successfully completed this additional task without assistance, in particular from specifically chosen committees. Taking into account the costs of travel and accommodation, the already high cost of the operation would have nearly doubled. No doubt a day will come when, debates on themes and regions being easier than they are now, it will be possible to expound history as it is revealed by a confrontation of knowledge and viewpoints on particular questions concerning all humanity.

Until the state of knowledge and of historical research in the world has reached this convergent point, we are obliged to give up the idea of showing the divergences that future historians will have to face. We have, however, provided notes at the end of articles, which have been written so as to ensure maximum diversity and the broadest possible participation. A certain degree of arbitrariness persists, of course. But this is unavoidable as long as the excesses that analyses lead to are not minimized through the elaboration of syntheses based on criteria derived from irrefutable logical presuppositions – presuppositions that help establish universal certitudes. Let us not forget, however, that innovations originate only within the gaps of certitude.

One of the merits of this work resides in the fact that it has succeeded in enlisting the collaboration of a very large number of people, representing a large number of regions and cultures. The Commission also encouraged the formation of local working groups responsible for obtaining and organizing the data to be included in the various chapters. This present work marks perhaps only the beginning of such collective efforts. Nevertheless, it enables us to anticipate satisfactory results. Knowing oneself well in order to make oneself better known constitutes a major contribution to mutual understanding. In this respect, historical research resembles an unearthing of unconscious phenomena. It brings to light that which in the nocturnal depths of individual or collective existences gives them life, so to speak, in spite of themselves or against their will.

This publication will no doubt give rise to much criticism. Even if these critical responses turn out to be harsh, they will justify the project, whose main objective is to arouse us from our dogmatic slumber. Historical events take care of this much more efficiently, but at a much higher price.

# GENERAL INTRODUCTION

*Georges-Henri Dumont*
*President of the International Commission*

Societies are making greater demands than ever on history, but urgent as they might be, these demands by various groups are not altogether straightforward. Some societies look to historians to define their identity, to buttress the development of their specific characteristics or even to present and analyse the past as confirming a founding myth. Conversely, other societies, influenced both by the *Annales* school of historiography and by the geographical, chronological and thematic enlargement of history, aspire to the building of bridges, the ending of self-isolation and the smoothing out of the lack of continuity that is characteristic of the short term.

In 1946, those attending the meeting of the first Preparatory Commission of UNESCO agreed that it was part of the fundamental mission of the United Nations Educational, Scientific and Cultural Organization to lay the foundations for a collective memory of humanity and of all its parts, spread all over the world and expressed in every civilization. The International Scientific Commission came into being four years later with the apparently gigantic task of drafting a *History of the Scientific and Cultural Development of Mankind*. Publication of the six volumes began in 1963, marking the successful conclusion of an international endeavour without parallel, but not without risks. Success with the general public was immediate and lasting, notwithstanding the reservations expressed by the critics, who often found certain choices disconcerting but who were not consistent in the choices and interpretations they proposed as alternatives.

Considering the amount of time required to prepare it, the first edition of the *History* must be seen as a daring achievement. Although it had a number of faults inherent in the very nature of historical knowledge, it nonetheless opened up new avenues and encouraged further progress.

In 1978, the General Conference of UNESCO decided to embark on a new and completely revised edition of the *History* because it realized that along with the considerable development of historiography – the improvement in what are called its auxiliary sciences and its growing links with the social sciences – there was an extraordinary acceleration of day-to-day history. What it did not know, however, was that the pace of this acceleration would continue to increase, bringing profound changes to the face of the world.

It scarcely needs saying that the task laid upon the International Scientific Commission, under the chairmanship of the late Paulo E. de Berrêdo Carneiro and then of my eminent predecessor, Professor Charles Morazé, was both enormous and difficult.

First of all, international teams had to be formed, as balanced as possible, and cooperation and dialogue organized between the different views of the major collective stages in the lives of people, but without disregarding the cultural identity of human groups.

Next, attention had to be given to changes in chronological scale by attempting a scientific reconstruction of the successive stages of the peopling of our planet, including the spread of animal populations.

Lastly, steps had to be taken to ensure that traditional methods of historical research, based on written sources, were used side by side with new critical methods adapted to the use of oral sources and contributions from archaeology, in Africa for the most part.

To quote what Professor Jean Devisse said at a symposium in Nice in 1986 on 'Being a Historian Today': 'If we accept that the history of other people has something to teach us, there can be no infallible model, no immutable methodological certainty: listening to each other can lead to a genuine universal history'.

Although historians must be guided by a desire for intellectual honesty, they depend on their own views of things, with the result that history is the science most vulnerable to ideologies. The fall of the Berlin Wall a few weeks after I assumed the presidency of the International Commission symbolized the end of a particularly burdensome ideological division.

In a way, the impact of ideologies will be lessened by the fact that the chief editors of each volume have sought the invaluable cooperation not only of experienced historians but also of renowned specialists in disciplines such as law, art, philosophy, literature, oral traditions, the natural sciences, medicine, anthropology, mathematics and economics. In any event, this interdisciplinarity, which helps avoid error, is undoubtedly one of the major

improvements of this second edition of the *History of Humanity* over the previous edition.

Another problem faced was that of periodization. It was out of the question to systematically adopt the periodization long in use in European history – i.e., Antiquity, the Middle Ages, and modern times – because it is now being extensively called into question and also, above all, because it would have led to a Eurocentric view of world history, a view whose absurdity is now quite obvious. The seven volumes are thus arranged in the following chronological order:

Volume I      *Prehistory and the Beginnings of Civilization*
Volume II     *From the Third Millennium to the Seventh Century* BC
Volume III    *From the Seventh Century* BC *to the Seventh Century* AD
Volume IV    *From the Seventh to the Sixteenth Century*
Volume V     *From the Sixteenth to the Eighteenth Century*
Volume VI    *The Nineteenth Century*
Volume VII   *The Twentieth Century*

It must be stated at once that this somewhat surgical distribution is in no way absolute or binding. It will in no way prevent the overlapping that there must be at the turn of each century if breaks in continuity and the resulting errors of perspective are to be avoided.

In his foreword, Professor Charles Morazé has clearly described and explained the structure of each of the volumes, with a thematic chapter, a regional chapter and annexes. This structure, too, may be modified so as not to upset the complementarity of the pieces of the mosaic.

Having completed their work, the International Scientific Commission, the chief editors of the volumes and the very large number of contributors will now be able to adopt as their motto the frequently quoted saying of the philosopher Etienne Gilson:

We do not study history to get rid of it but to save from nothingness all the past which, without history, would vanish into the void. We study history so that what, without it, would not even be the past any more, may be reborn to life in this unique present outside which nothing exists.

This present will be all the more unique because history will have shown itself to be not an instrument for legitimizing exacerbated forms of nationalism, but an instrument, ever more effective because ever more perfectible, for ensuring mutual respect, solidarity and the scientific and cultural interdependence of humanity.

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# PREFACE TO VOLUME VII

*Sergeï L. Tikhvinsky*

The seventh and final volume of the *History of the Scientific and Cultural Development of Humanity* is at last available to readers of this unique collection prepared under the supervision of the International Commission constituted by Resolution 4/1.2/6, which was adopted by the General Conference of UNESCO at its 20th session in 1978. Devoted to the twentieth century, this volume was begun along with the other six volumes, but owing to financial difficulties and changes in the staff of the UNESCO Secretariat over the last decade of the century, the preparation of Volume VII (as well as Volume VI, entitled the *Nineteenth Century*) was interrupted for several years. As our readers know, the previous volumes of the *History of Humanity* were published in English by UNESCO and the British imprint Routledge: Volume I, 1994; Volume II, 1996; Volume III, 1997; Volume IV, 2000; Volume V, 1999; and Volume VI, 2004.

The last meeting of the Editorial Board of Volume VII took place in June 1996 at UNESCO Headquarters in Paris. At this meeting, the Board discussed and approved a detailed outline and established a calendar for the completion of the writing and editing processes. Over the following nine years, all contacts between the members of the Editorial Board and the staff of the UNESCO Secretariat were limited to occasional parcels or faxes containing drafts of proposed articles.

Volume VII reflects the great variety of cultures to be found in countries around the world. In spite of increasing interdependence, it can be noted that every nation still strives to maintain its unique cultural identity.

During the above-mentioned meeting of the Editorial Board conducted under the chairmanship of Professor Georges-Henri Dumont from Belgium, President of the International Commission of the History of the Scientific and Cultural Development of Humanity, members of the Board from Argentina, China, India, Russia, Senegal and the United States as well as a representative of the Palestine National Authority expressed their views about the preliminary text of Volume VII as proposed by Professor Everett Mendelsohn from the United States.

The participants of the meeting suggested that authors of the various chapters devoted to the development of science and culture during the century should place them in the context of the period's main political, economic and social processes throughout the world, rather than to set out to undertake 'a political analysis of the century'. Professor Dumont stressed the importance of examining the twentieth century's influence on science and culture, the consequences of the Cold War, the disintegration of the Soviet Union, European unity, ethnic issues, problems of cultural identity following decolonization, and extremist religious movements. Other participants of the discussion emphasized the need to reflect on the growing rift between poor and rich countries and to condemn racism, apartheid and genocide. All participants highlighted the need to explore the process of decolonization and its consequences on the state of education, science and culture in the countries of Africa, Asia and Latin America. They appealed to the authors not to focus only on the negative processes that took place in these countries over the course of the century, but to include the century's positive events and developments as well.

The views and remarks of the members of the Bureau of the International Commission as expressed during that meeting were summarized by the Secretariat and transmitted to the commissioned authors.

In many respects, this final volume of the *History of Humanity* is unique: whereas readers of the preceding volumes generally accept the facts and evaluations presented by the various authors, some readers of Volume VII might disagree with the manner in which certain authors interpret particular events of the twentieth century. This can be explained by the fact that practically all readers of Volume VII will have been born and spent most of their adult life in the twentieth century; indeed, many were not only contemporaries, but also witnesses, and in some cases, actors in the major events of the century. Moreover, they will know about many aspects of the earlier decades of the century through their parents, relatives and friends of elder generations. Therefore many readers will have made their own subjective evaluations of certain events and processes mentioned in this volume. Likewise, as they were educated in the twentieth century, some of the authors were necessarily influenced by the century's events and the

prevailing ideologies and viewpoints. According to a popular adage, 'large objects can only be seen from a distance'. More time is required to develop a multifaceted, objective evaluation of the stretch of the road that humankind has travelled in the twentieth century. When asked how much time people needed to be able to understand the past century, the late-nineteenth-century Russian historian V. Kliuchevsky answered, 'three centuries'.

It is well known that the process of history cannot be cut artificially in a Procrustean manner. So it is with the process of globalization that began several centuries ago and accelerated rapidly in the twentieth century to reach its zenith in the era of cyber communication. In the diverse fields of economy, politics, science and culture, the twentieth century is the continuation of the nineteenth century and witnessed advances in these fields at an ever-accelerating rate.

Similarly, many events that took place in the nineteenth century had their origins in the eighteenth century. For this reason, the authors of Volume VI (from over forty countries) defined the volume's time frame as the period extending from the French Revolution (1789) to the beginning of the First World War (1914).

Many authors in the present volume begin by an incursion into the end of the nineteenth century and the first decade of the twentieth century even though the latter period was already dealt with by some authors of Volume VI. The main division of the *History of Humanity* into centuries is sometimes very arbitary: in China, Korea and Japan and in other East-Asian countries, the system of chronology was based on the rule of a particular emperor or king. In rural areas of these countries, the lunar calendar with its 60-year cycles is still observed. In countries with sizeable Muslim populations, the Islamic calendar began in 622 AD, the year of the Hegira, marking the emigration of the Prophet Mohammed from Mecca to Medina

Before the 1917 Revolution, Russians observed the Julian calendar, which is 13 days behind the more widely observed Gregorian calendar. In 1924, Greece accepted the Gregorian calendar, followed by Turkey in 1927 and Egypt in 1928.

Within the twentieth century, there are also different types of chronological divisions specific not only to various countries but also to distinct branches of science, culture, the arts, sports, etc. The authors contributing to this volume use various means of dating events and processus discussed in their contributions. Some authors consider revolutions to be the principal landmarks of the twentieth century (e.g., the Chinese Revolution of 1911, which overthrew two thousand years of imperial rule and proclaimed a Chinese republic; the revolutions of February and October 1917 in Russia; the Revolution of 1949, which led to the proclamation of the People's Republic of China, etc.). Other authors take as their reference points the First and Second World Wars and the Cold War. Many authors employ such terms as 'atomic era', 'cosmic era', 'era of radio and television', 'jet-propulsion aviation era', 'era of DNA, 'transition and laser era', etc. For former colonies, the chronology of the twentieth century is neatly split into the colonial and post-colonial periods. More than a chronological demarcation, this dividing line reflected a change in historical outlook.

Like previous volumes, Volume VII consists of two parts: a thematic section and a regional section. The chapters of the first section deal with the principal types of transformations observed throughout the world in the twentieth century, the changes in everyday life of different strata and groups of the population (women, young people, elderly people, the disabled, etc.) and evolutions in the fields of education, public health, sports, and in diverse branches of culture, and natural, social and human sciences. In the second section, these subjects are illustrated through examples taken from the regional level and from different countries.

The authors of this volume are scholars from various countries around the world, and they are responsible for the accuracy of the facts contained in their contributions as well as for their evaluation of events and processes.

# ACKNOWLEDGEMENTS

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INTRODUCTION

# THE TWENTIETH CENTURY
# IN WORLD HISTORY

*Georges-Henri Dumont*

When did the twentieth century begin? If we refer strictly to the Gregorian calendar, the response is clear, but as Charles S. Maier demonstrates in the first chapter of this volume, the period from 1901 to 1914 was, in many respects, a continuation of the nineteenth century. In the few industrialized countries of that period, social stratification continued and was intensified by technological progress. The majority of the world's population, which did not have access to the advances of that era, was still engaged in agriculture or traditional production activities. The imperialist world order, which took the form of colonialism in Africa and Asia, was consolidated by this division. The Austro-Hungarian Empire of the Habsburg Monarchy and the Russian Empire of the tsars were multi-ethnic formations that survived in this political context and led to competition, crises and alliances in which colonial rivalries also played a part.

If there is a break with the nineteenth century, it coincides with the First World War, which marks the beginning of what historian Eric J. Hobsbawm calls 'the short twentieth century'.

## THE POST-WAR PERIOD

If we agree that the final battles of the absurd war that lasted from 1914 to 1918 marked the end of the nineteenth century, we must also acknowledge that in 1919, as soon as the treaties of Versailles, Saint-Germain, Trianon, Neuilly and Sèvres had been signed, many of the economic and social problems that were to beset the twentieth century emerged, as did the new century's chosen political orientations. Having bled itself dry for more than four years, resorting to loans after using up all of its reserves to pay for weaponry, Europe forfeited the control of the world's economy that it had exercised for centuries. It was no longer a creditor but a debtor, owing money in particular to the United States, which supplanted it as the world's economic leader.

Treaties are to some extent an opportunity for the victors to settle old scores, and Woodrow Wilson, President of the United States, whose intervention in the war had been decisive, wanted more than the usual diplomatic settlements that had prevailed over the centuries. Wilson proposed bringing the world's moral and spiritual forces together to create a permanent organization that would maintain peace

forever. Although the League of Nations was based on Woodrow Wilson's ideas and his mystical approach to democracy, the United States, paradoxically, was not a member. Léon Bourgeois of France was soon persuaded of the need to create, within the framework of the League of Nations Assembly, an International Committee on Intellectual Cooperation that would study the problems involved in coordinating science libraries, copyright, the preservation of the architectural heritage in Europe and Asia, the organization and role of museums and the collection of major musical compositions and educational films. Albert Einstein, Marie Curie, Henri Bergson, Gonzague de Reynold and Jules Destrée were among the twelve internationally recognized figures who were appointed as members of the committee. Subsequent members included Salvador Madariaga, John Galsworthy, Félix Weingartner, Paul Valéry, Helen Vacaresco and Henri Focillon.

Meanwhile, alas, the first links were being formed in a chain that was to lead to another catastrophe. While in countries whose parliamentary tradition had survived the upheavals of war, power alternated or was shared between socialists and conservatives on a democratic basis, in those countries where poverty had exacerbated the humiliations of defeat or the disillusion of victory and where there had been any kind of revolutionary or nationalist agitation to prepare the ground, the masses were prepared to follow charismatic orators from both the left and the right wings.

In 1917, tsarism had already collapsed in Russia. In the course of the last two months of that year and the first two months of 1918, before the German advance into Russian territory, the All-Russian Congress of Soviets decided to abandon the war. On 23 February 1918, with the German army occupying most of Western Russia and the Ukraine, the new Soviet Government, urged on by Lenin, began forming the Red Army in order to repulse first the German troops and subsequently those of the fourteen states which, alongside the White Army, had joined the military intervention against Russia.

Having emerged victorious from the struggle with the White Army and its allies, Russia was confronted by a drop in agricultural production and an economic depression. Lenin, assisted by L. N. Krassin, the People's Commissar for Trade and Industry, launched the New Economic Policy (NEP), which was beginning to produce its first

*Map 1* **Europe after the First World War**

States created after the First World War

positive results when Lenin was struck down by an attack of hemiplegia. He left the political stage in March 1923 and died in January 1924 (Plate 1).

The fascination of many Western intellectuals with communism, which they regarded as being synonymous with democracy, has been analysed by French historian François Furet.

At first sight, the goals of communism can indeed be mistaken for the goals of democracy, which explains its attraction. They both hope to rid the world of all domination and exploitation. But once Stalin had become secretary-

general of the Communist Party in 1922, he played one supporter against the other, sidelined his opponents and imposed his autocratic rule step by step. Equality was supplanted by party favouritism, fraternity by betrayal and liberty by force.

In Germany, where the Reich had given way to the Weimar Republic, the left wing of the workers' movement and the Spartacists, inspired by the apparent success of the Soviets, tried to stage a revolt. However, they lacked popular support and their leaders, Karl Liebknecht and Rosa Luxemburg (Plate 2), were brutally killed on the

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orders of the German military establishment. The June 1920 elections revealed that opinion had shifted in favour of the right wing, though not yet to the extreme right. The peace treaties had not been negotiated according to the European tradition of public law. They had been imposed on Germany and were considered by both the army and the people to constitute a *diktat*. Hitler impressed the German masses by his ability to deal with the consequences of the Treaty of Versailles in three years. He presented both communism and capitalism as Jewish initiatives. The spectre of hidden forces — constituted by Jews, Jesuits and Freemasons, who were described as *heimatlos* — led to anti-Semitism and a perversion of Darwinism that gave rise to the idea of a superior race. Six million people — mostly women, children and elderly people — were to be exterminated in the application of this barbarous ideology.

Although the Italians had won the war, they felt they had lost the peace. Widespread discontent with the occupation of factories by workers was exploited by Benito Mussolini, who had founded a new movement, the Fasci di Combattimento, in March 1919. Mussolini abandoned his programme of revolutionary social reforms in favour of nationalism, the glorification of ancient Rome and the exaltation of force and of the leader (or Duce, as Mussolini was to be known), and won over the middle classes, civil servants, tradespeople, farmers and students. When some 50,000 Fascists marched on Rome, they met no resistance, and Mussolini became prime minister.

On the other side of the Atlantic, the Americans were carried away by the prosperity generated by their technical innovations and new production methods, particularly in the automobile industry. Proud of aviator Charles Lindbergh, who had flown non-stop from New York to Paris in May 1927, they were happily buying cars, radios, electrical appliances and furnishings on credit and indulging in a frenzy of speculation on the stock market, which resulted in boosting share prices to levels completely out of proportion with the real value of the firms concerned. In October 1929, the whole system collapsed in a matter of days. In fact, the crash on Wall Street coincided with a downturn of the Kondratieff cycle, conferring on it an aura of unprecedented drama (Plate 3).

The interdependence of the world's economies was soon apparent to all: the crisis promptly became international in scope as it engulfed one country after another. Banks collapsed, factories shut down and raw materials rotted in warehouses. In Brazil, coffee was even used as fuel and burned in the boilers of locomotives. Many countries resorted to protectionism to remedy the situation, restricting imports and raising customs duties.

In the United States, the New Deal introduced by F. D. Roosevelt, elected to the White House on 8 November 1932, led to a recovery assisted by an upturn in the economic cycle, but in Germany the increasing poverty resulting from the depression played into the hands of Hitler's Nazi Party (NSDAP). At the legislative elections held in September 1930, he won 6.4 million votes and 107 seats. Heavy industry supported him by contributing some 2 million marks to his party annually. In the presidential elections of 1932, Hindenburg, still a symbolic figure, won a majority, but Hitler's 13.6 million votes more than doubled the number he had obtained in 1930, and this score was confirmed in that year's legislative elections. On 30 January 1933, Hitler became head of government and established his dictatorship by the ruthless elimination of all opponents and rivals, notably in the so-called 'Night of the Long Knives'.

## A SERIES OF DISASTERS

The series of disasters of the 1930s began in Asia in 1931 with Japan's attack on Manchuria. When the League of Nations condemned this act, Japan responded by leaving the organization in 1933. The West did not want to risk a war in the Far East, and China was compelled to tolerate Japanese occupation of Manchuria, allegedly independent under the rule of P'u-Yi, the last emperor of the Manchu Dynasty, who had been deposed in February 1912.

In October 1933, Germany also left the League of Nations, which it had joined in 1926. The collective security mechanism proposed to the League of Nations by Mr Litvinov, the Soviet Commissar for Foreign Affairs, in 1935 was coming apart, and the fragility of the agreement between France and Great Britain gave the dictators considerable leeway. On 16 March 1935, Hitler violated the Treaty of Versailles by reintroducing compulsory military service and unveiled his plans to reconstitute an army numbering between 500,000 and 600,000 men. France's reaction was to sign a rather vague mutual assistance treaty with the Soviet Union, while Great Britain, without consulting France, authorized Germany to build warships of up to 35 per cent of British tonnage.

In the same year, Mussolini attacked Ethiopia with a view to expanding Italy's territory. Ethiopian Emperor Haile Selassie in turn appealed to the League of Nations, but the resulting economic sanctions against Italy proved to be a fiasco, and the 'empire of the Negus' fell under Italian control.

In March 1936, German troops marched into the demilitarized Rhineland. This was the last opportunity to keep Hitler in check without starting a war. The German troops had orders to withdraw if the French army intervened to prevent the occupation. However, France did not dare make take such action at a time when Italy was protesting against the sanctions decided on by the League of Nations and Britain was negotiating with Hitler. The Rome-Berlin axis was born.

Officers of units stationed in Spanish Morocco mutinied under orders from General Francisco Franco in 1936, and the movement spread to several cities in Spain. The Republican Government opposed the movement, thereby setting the scene for civil war in Europe. Taking advantage of the fact that Great Britain (obsessed by fears that communism might gain a foothold in Spain) and the France of Léon Blum's Popular Front had decided not to intervene, Nazi Germany and Fascist Italy sent equipment and thousands of soldiers to confront the volunteers making up the multinational brigades opposed to Franco. An appalling civil war ensued. 'The firing squads are mowing people down like hay', noted the French aviator and writer Saint-Exupéry. On 26 April 1937, the Luftwaffe bombed the Basque town of Guernica. Two years later, Franco had triumphed and proclaimed himself El Caudillo (leader), joining the Duce and the Führer.

In the meantime, the Nazis had marched into Austria, meeting no resistance. However, more was to come. After

a meeting in Munich on 30 September 1938, Chamberlain and Daladier agreed to the dismantling of Czechoslovakia, naïvely convinced that their policy of appeasement had been successful. That illusion was soon to be dispelled: on 14 March 1939, pro-Nazi Slovakia proclaimed its independence and Bohemia and Moravia were declared a German protectorate. The city of Memel (Klaipeda) and Memelland were seized from Lithuania, and shortly afterwards Mussolini took possession of Albania.

Although it was rather late for the democracies to reverse their policy, they eventually did so by guaranteeing the independence and territorial integrity of Poland, Romania and Greece. In fact, they were incapable of defending any peoples, as Stalin well knew. In the summer of 1939, against a background of continuing negotiations between the USSR and the West, the German-Soviet Pact was concluded. Poland was immediately invaded by the new partnership, although Russia did not join sides in the war until it was attacked by the Nazis on 21 June 1941, which marked the true outbreak of the Second World War. Of a far greater magnitude than the preceding world war, it was to engulf a larger area, bringing with it the horror of systematic genocide exemplified by the Holocaust. Over and above territorial considerations, the very future of civilization was at stake.

In Chapter 2, Charles S. Maier divides the Second World War into four distinct conflicts. The first conflict involved Western Europe. From April to June 1940, Hitler took over Norway, Denmark, the Netherlands, Luxembourg, Belgium and France. Great Britain found itself fighting single-handed on both the Atlantic and the North African fronts. The second conflict, which had a more ideological dimension, began in June 1941 when the Führer decided to invade Russia. The defeat of the German army at Stalingrad on 2 February 1943 was the turning point in this theatre. The third conflict saw Japan overrun the whole of South-East Asia. The Japanese bombing of the American naval base at Pearl Harbor on 7 December 1941 enabled President Roosevelt to surmount the pacifism widely supported by the American public and lead the United States into the war (Plate 4). Until then, the American participation was limited to providing equipment to Great Britain and Russia under the Lend Lease Programme. Despite the Americans' superior weaponry and their contribution to the defeat of Germany in May 1945, the conflict with Japan appeared likely to endure. To curtail it, the United States resorted to atomic weapons in August 1945. The resistance movements in occupied France, Belgium, Norway, Greece, Yugoslavia, Poland and Russia and in South-East Asia were the protagonists of the fourth conflict, which was a key feature of the war despite its lower profile.

A fifth conflict could be added: the battles in North Africa, which continued with the landings in Italy and the collapse of the Fascist dictatorship.

The Second World War also differed from the preceding war by doing away with the dividing line between civilians and combatants. The bombing of Warsaw, Leningrad, Rotterdam, London and Coventry by the Germans, the Allied bombing of Berlin, Hamburg and Dresden, and finally the atomic bombs dropped on Hiroshima and Nagasaki, all targeted civilian populations. If those who died of hunger are included, the civilian death toll probably numbered approximately fifty million.

## ANTI-COLONIALIST MOVEMENTS AND AGITATION BETWEEN THE WARS

While certain European countries were swept by revolutionary fervour from 1920 onwards, Asia and Africa were trying to throw off the yoke of the West. On the one hand, communism encouraged liberation from colonialism, as much out of self-interest as on principle, and on the other hand, the colonized peoples were hearing echoes of Woodrow Wilson's support for self-government. Once released from Ottoman domination by the Allied victories, the Arab States had to contend with British and French ambitions and also the aspirations of the Jews, who had been encouraged by the 1917 Balfour Declaration supporting the establishment of a national home for the Jewish people in Palestine. They found it increasingly difficult to accept the presence of British troops in Baghdad and Jerusalem and of French troops in Beirut.

While Kemal Ataturk repelled the Greeks who had landed in Smyrna, Abd-el Aziz Ibn Saud, the leader of the Muslim Wahhabi sect, deposed Emir Hussein in 1924–1925 to proclaim himself king of what was to become Saudi Arabia. To compensate Hussein's two sons, the British offered the Kingdom of Iraq to Faisal and the Emirate of Transjordan to Abdallah. In the Middle East, tension was thus building up to dangerous levels.

In Persia, theoretically independent (but in fact under the control of the West), Reza Khan, who had commanded a Cossack squadron in Tehran, used a nationalist movement as a basis to seize power and proclaim himself Shah of Iran (Plate 5). In Afghanistan, King Amanullah sought to break loose from the pervasive influence of the British by demonstrating willingness to collaborate with the Soviet Union.

India had sent one thousand soldiers to fight on the battlefields of Europe and borne a considerable proportion of British war costs. In exchange, Indian intellectuals expected their country to be granted autonomy in the form of a dominion status similar to that of Australia and Canada, but the new constitution proposed by Great Britain failed to fulfil these expectations, and the resulting disturbances were severely repressed by the British. Gandhi, a frail-looking man with a gentle yet stubborn temperament who had worked as a lawyer in Bombay, became the spokesperson for the independence movement. He inspired an admiration bordering on awe as he went about preaching passive resistance and civil disobedience and shunned violence. Eventually a violent confrontation occurred between the ancient Indian traditions and British imperialism. Responding to his frequent imprisonments with hunger strikes, the Mahātmā (great soul) exerted an ever-growing fascination on the masses.

Strictly speaking, China had never been colonized, but for a long time, successive Western interventions had severely restricted its independence. There was a puppet government in Beijing, which was dominated by several Chinese military cliques supported by various foreign powers. Sun Yat-sen, and after him Chiang Kai-shek, worked for the unification of China and the abolition of the military cliques. Sun Yat-sen's collaboration with Moscow was decisive. The USSR supported the Kuomintang in its armed struggle against the government in Beijing by supplying arms and dispatching military and political experts. It also organized a modern army, led by Chiang Kai-shek.

In Egypt, nationalist disturbances made Great Britain renounce its protectorate in 1923 and eventually recognize the country's independence, with reservations regarding defence and foreign affairs in particular. The Wafd Party, having won the 1924 elections, continued to pursue its objective of complete freedom from British domination.

Algeria, Tunisia and Morocco were increasingly considered the linchpins of the Muslim community. There was no threat as yet to France's position in Algeria, but in Tunisia the Destour (Constitution) Party was calling for an end to the protectorate and provoking serious incidents. In Morocco, Spain suffered a humiliating defeat at the hands of dissident Rif tribes, and a republic of the confederated Rif tribes was created by a little-known local leader, Abd el-Krim. In 1925, he attacked French Morocco, but the following year the combined French and Spanish forces led by Marshal Pétain forced him to surrender.

From sub-Saharan Africa came as yet no more than faint stirrings: meetings in Kenya organized by Thuku calling for the end of forced labour and the redistribution of land; in the Belgian Congo, the enigmatic utterances of the preacher Kimbangu; and the sudden wave of strikes in Sierra Leone and Gold Coast, formerly part of German Togo.

## THE BURGEONING OF SCIENCE, THE ARTS AND LITERATURE FROM 1918 TO 1940

Whatever else may have happened between the two world wars, it was a period of intense activity in science and produced an abundance of works of art and literature.

Science, especially physics, with the extension of the quantum theory announced by Max Planck in 1900, continued to expand and intensify activity in its fields of investigation. Disciplines became specialized to such an extent that close international collaboration became essential. Einstein would not have been able to formulate his theory of relativity without the experiments of the American Michelson, the formulas of the Dutch physicist Lorentz and the work of the Lithuanian-born mathematician Minkowski. French physicist Louis de Broglie, the initiator of wave mechanics, based his formulation on a combination of quantum theory and Maxwell's electromagnetic theory.

Chemists produced explosives and poison gas but also synthetic medicines and plastic materials, thereby fostering the rapid expansion of photography and cinema, and of insulin, which revolutionized the treatment of diabetes. While physicists proclaimed the existence of the atom, biologists began deciphering the mysteries of the gene.

A new generation of artists and writers emerged from the war with hostility to authority and a desire to break with the traditions of the preceding generations, as evidenced by the work of cubists in France, futurists in Italy, De Stijl in the Netherlands and constructivists and suprematists in Russia, to name the most prominent avant-garde movements. Some members of the literary and artistic avant-garde appropriated dadaism (dating back to 1917), German expressionism and the pre-1914 French literary movement known as unanimisme.

John Willett wrote that surrealism sprang out of dadaism as if making a plea for a revival of the imagination, following the revelation of the unconscious by Sigmund Freud, and for a new emphasis on magic, chance, the irrational, symbols and dreams. In eschewing any rational control, surrealists created a kind of cohesion of the incoherent. Surrealism had a crucial influence on writers such as André Breton, Paul Éluard and Louis Aragon in France, Federico Garcia Lorca in Spain and, to a lesser extent, César Vallejo and Pablo Neruda in Latin America. Transformations of its dream-like images and visions into a form of 'magic realism' can be seen in the paintings of Max Ernst and René Magritte and Salvador Dalí, and in the early films of Luis Buñuel, Jean Cocteau and Jacques Prévert.

While the avant-garde surged forward, many others seeking to re-establish centres of gravity for the spirit and a moral code to help control instinctive forces, focused on contemporary social issues. This was true of the Catholics Paul Claudel, François Mauriac, Georges Bernanos and Paul Valéry, a disciple of Mallarmé, in France. In Italy, Giuseppe Ungaretti adopted a neoclassical approach. Expressing themselves in the German language, Rainer Maria Rilke explored the secret life of the soul, Thomas Mann scrutinized the Hanseatic bourgeoisie, Franz Kafka described the absurd, and Ernst Jünger denounced Nazism in veiled terms, while Bertolt Brecht openly opposed it. In England, scepticism verging on pessimism and a tendency towards sarcasm characterize the work of D. H. Lawrence, James Joyce and George B. Shaw. The exiled American poets T. S. Eliot and Ezra Pound were exceptions. In the United States, writers became aware of their country's different groups and described them in language sometimes far removed from classical English: John Dos Passos with an often brutal energy, Ernest Hemingway with a restrained force, and William Faulkner with refinement.

More than in the nineteenth century, cosmopolitanism encouraged the circulation of both artistic works and their creators. It permeated the works of Paul Morand, André Malraux, Herman Keyserling and Somerset Maugham and enabled the West to discover the Indian poet, Rabindranath Tagore. The École de Paris (the Paris School), which extended its influence as far as the United States, included artists such as Van Dongen (a Dutchman), Picasso (a Spaniard) (Plate 6), Modigliani (an Italian) and Foujita (a Japanese).

In the years following the creation of the Soviet Union, the new regime accepted various predominantly leftist intellectual and artistic tendencies; however, in the early 1930s, the Communist Party outlawed many avant-garde movements and proclaimed so-called 'social realism' as the only officially acceptable artistic doctrine.

Maxim Gorky rallied to the Communist regime, Vladimir Mayakovsky took to singing the praises of the Revolution, and Mikhail Sholokhov, whose writing has sometimes been compared to Tolstoy's, entitled his best-known work *Quiet Flows the Don*. Others, such as Boris Pasternak, were forced underground, and their works would only become known after the Second World War.

Despite the growing reputations of such innovators as Arnold Schönberg and Alban Berg, the avant-garde had little effect on opera, no doubt because the bourgeois audience for this musical genre had no wish to be shocked. Its international repertoire went no further than Richard Strauss or Leos Janacek, and Giacomo Puccini was a staple almost everywhere. But ballet, which had traditionally been associated with opera, was almost completely transformed even before the end of the First World War. In 1917, the

Russian impresario Sergei Diaghilev staged *La Parade* in Paris to music by Eric Satie and with a scenario by Jean Cocteau, scenery and costumes by Pablo Picasso and a programme-introduction by Guillaume Apollinaire. Diaghilev would subsequently collaborate with Igor Stravinsky, Sergei Prokofiev, Georges Auric, Darius Milhaud, Manuel de Falla and Francis Poulenc for musical accompaniment, and Georges Braque, Juan Gris, André Derain and Georges Rouault for set designs and costumes. People were soon flocking to see Diaghilev's ballets, and this brought recognition for the composers and painters involved.

In America, a new style of music known as jazz, which had emerged from the migration of Southern blacks to the cities of the North-East, gained recognition abroad (Plate 7). Welcomed with open arms by the avant-garde because it represented a break with tradition, jazz was seen as a symbol of modernity, and Duke Ellington became a cult figure. The technological developments that led to the establishment of the record industry and radio soon made jazz the universal language of youth culture. Other signs of cosmopolitanism, the Argentine tango and the samba of the carnival of Rio, reigned supreme in dance halls throughout the 1920s.

Before the First World War, cinema had been more a curiosity than an art, but the situation changed during and after the conflict. Charlie Chaplin (Plate 8) was an undisputed genius, and in both Weimar Germany and Soviet Russia avant-garde directors created noteworthy art films. *Battleship Potemkin* by Sergei Eisenstein emerged as a masterpiece of silent film. From the 1930s, the talented populist films of René Clair, Jean Renoir and Marcel Carné stood their ground against the tidal wave from Hollywood, which had secured the collaboration of European exiles such as directors Fritz Lang, Ernst Lubitsch and Billy Wilder and actresses Greta Garbo (Plate 9) and Marlene Dietrich.

As the Second World War approached, India was producing 170 films a year and Japan more than 500, but Hollywood alone, releasing more than 10 films a week, had greater access to world-wide distribution.

Once art nouveau had wound down, the artistic and political avant-garde also set its seal on architecture and the decorative arts for a time. The innovative Bauhaus school for architecture and applied arts founded by Gropius was dissolved in 1933, the same year Hitler took power. Hitler, Stalin and, to a lesser extent, Mussolini opposed all forms of modern art, which they considered decadent. Instead, they encouraged a monumental neoclassical architectural style devoid of originality. In the democracies, on the other hand, innovation was more sought after, thanks to pioneers such as Swiss-born Le Corbusier (Plate 10) and the German-born Mies van der Rohe, who reacted against the extensive use of ornament and sought to set architecture on a rationalist path by favouring clean and simple lines and elegant sobriety.

## HOPES OF A NEW WORLD ORDER

Once the war was over, the full horror of the concentration camps was exposed. In addition to resorting to firing squads, torture and deliberate starvation, Hitler had literally industrialized death. In the concentration camps, the Nazis built gas chambers in which the victims were suffocated by Zyklon B, a gas containing prussic acid. In Auschwitz, the gas chambers could kill 10,000 men, women and children a day. The ovens functioned 24 hours a day, and the ashes and bone fragments that remained were used as agricultural fertilizer.

Realizing that the re-establishment of peace would require quite a different approach from that needed to win the war, all the states that had been directly or remotely involved in the Allied effort proclaimed their determination to save succeeding generations from the scourge of war, which twice in our lifetime has brought untold sorrow to mankind. The United Nations founding conference was held in San Francisco from 25 April to 30 June 1945. Its Member States undertook to take collective action to maintain peace and friendly relations, based on the principle of equal rights of peoples and their right to self-determination, to deal with economic and social, intellectual and humanitarian international problems in a manner respectful of human rights and fundamental freedoms for all, without distinction of race, sex, language or religion (Plate 11).

Although the United States had not joined the League of Nations, it was the driving force behind the United Nations, which had at its disposal financial and technical resources vastly superior to those of the League of Nations, and a network of specialized agencies. UNESCO was founded to deal with education, science and culture, while the International Labour Organization and the World Health Organization focus on work- and health-related issues, respectively. Other specialized agencies included the Food and Agriculture Organization, the International Bank for Reconstruction and Development, the International Monetary Fund, the International Civil Aviation Organization, the World Meteorological Organization, the Universal Postal Union and the International Telecommunications Union. Subsequently, other institutions would be set up as needed, for example the United Nations Development Programme and the United Nations Environment Programme.

The twenty Member States that founded UNESCO in London on 16 November 1945 wished to resume the work of the defunct International Committee on Intellectual Cooperation in a considerably broadened scope. Meeting amidst the smoking ruins of the British capital, they asserted that, in the words of American poet Archibald MacLeish, 'it is in the minds of men that the defences of peace must be constructed'. In the second half of the twentieth century, UNESCO carried out a considerable number of tasks: promoting the right to education; effectively contributing to the rescue, safeguarding and enhancement of humanity's cultural and natural heritage; providing support for artistic creativity, so often stifled and endangered by the new technological and economic environment; mobilizing political leaders to increase and share scientific knowledge; promoting the free flow of words and images; and attempting to reduce the flagrant imbalance in access to information and means of communication available to industrialized and developing countries.

More vulnerable than the specialized agencies, the United Nations General Assembly and Security Council often proved incapable of taking positions. At the beginning of 1947, fighting was reported in China, Greece, Palestine, India, Indonesia and Indo-China, and the USSR pursued its eastern European expansion, which Stalin considered essential to the country's security.

Meeting in Yalta, Roosevelt, Churchill and Stalin divided Europe along the front lines reached by Allied forces. Neither Roosevelt nor Churchill had wanted this division, but the two leaders resigned themselves to the *fait accompli*. The countries of Central and Eastern Europe were subsequently plunged into communism: Poland and Czechoslovakia after unsuccessful attempts to save a parliamentary regime, and Romania, Bulgaria and Albania by communist minorities supported by the Soviet Union. Tito's Yugoslavia was the only country to opt spontaneously for a people's democracy, thus obtaining a degree of freedom from the Kremlin.

On 10 December 1948, the United Nations General Assembly adopted the Universal Declaration of Human Rights. Forty-eight of the then Member States voted in favour, none against and eight abstained. The text's principal author, Nobel Prize winner Professor Cachin, once drew a distinction between the declaration proper and the implementing measures, which he considered more important and less carefully elaborated. Unfortunately this assessment remains relevant at the beginning of the twenty-first century, notwithstanding the development of new generations of rights: economic, social and cultural rights, the right to education, development and humanitarian assistance, the rights of the child, and so on.

## THE COLD WAR

Germany was split in two by the Potsdam Conference (1945), but Berlin had a special status, occupied by the Soviets in the east, the British in the north-west, the Americans in the south and the French in the south-west. The sectors administered by the Americans and British promptly became a bizone, the nucleus of the future federal state of West Germany.

Communist ideology had not just penetrated Central and Eastern Europe. Civil war was raging in Greece, and had it not been for the presence of 40,000 British soldiers, the country might have fallen to the guerrillas (*andartes*) of Markos Vafiadis, making Turkey an indefensible outpost in an ocean of communism. Of even greater concern to the President of the United States, Harry Truman, was the considerable threat of the communist parties in France and, especially, Italy. Truman considered it necessary to counter the risk of economic, social and political disintegration by supporting Europe with America's surplus resources. The Marshall Plan was approved by the United States Congress on 2 April 1948 and administered by the sixteen members of the Organisation for European Economic Co-operation (OEEC).

Stalin's response to the introduction of the new German mark and the creation of the OEEC and the bizone was to block land access to West Berlin. Two million Berliners might have starved or frozen to death if the Americans had not airlifted supplies of food and coal. The blockade was finally lifted on 12 May 1949. One month earlier, the first steps towards the American policy of containment had been followed by the signing of the North Atlantic Treaty on 4 April, which involved the United States in the Western defence system (Plate 12).

A world divided into two camps, each armed with atomic weapons, was entering the period of the Cold War, and the first confrontation occurred in the Far East. Despite receiving American aid worth over \$2.2 billion between 1945 and 1949, the armies of the discredited Chinese government of Chiang Kai-shek were beaten by the troops of communist leader Mao Zedong. The struggle came to an end on 1 October 1949, when Mao proclaimed the establishment of the People's Republic of China, and Chiang Kai-shek took refuge in Taiwan, an island militarized by the Americans.

No sooner had the communists triumphantly concluded the civil war in China than another conflict broke out. On 25 June 1950, the armies of the Democratic People's Republic of Korea (known as North Korea) crossed the 38th parallel, which, by virtue of the Tehran Conference (1943), separated it from its rival to the south, the conservative Republic of Korea. The latter, led by Syngman Rhee, was recognized by Washington, while North Korea, led by Kim Il-Sung, was recognized by the USSR.

The matter was immediately submitted to the United Nations Security Council, which the USSR was boycotting in protest against the presence of a representative of Chiang Kai-shek's Nationalist Chinese Government. As there was no risk of the notorious veto being applied, the Security Council decided to oppose the aggressor by force and requested that the United States appoint a commander to the intervention force that would fight under the United Nations flag.

Many West European contingents rallied to the United Nations' call, but there was no doubt that operations were financed and directed by the United States. Initially, the intervention forces drove the invaders back to the border with Manchuria, but the unexpected mass intervention of the Chinese communists, supported by the USSR, changed the situation. It took the skilful strategy of General MacArthur to give the United Nations troops the advantage once again, and the Chinese-North Korean forces were driven back beyond the 38th parallel. General MacArthur, who publicly favoured an all-or-nothing approach, hoped to continue fighting until he reached Manchuria. Refusing to take responsibility for unleashing a global conflict, President Truman overruled General MacArthur and recalled him.

When the Chinese and North Koreans realized they could not win, they agreed to negotiate, and an armistice reinstating the status quo before the outbreak of the conflict was signed in Panmunjom on 27 July 1953.

The Cold War had been intensified by the Korean War. The United States sought allies, urging Japan to reconstitute a defence force, and in 1954 the Americans sponsored the creation of the Southeast Asia Treaty Organization. In the same year, the United States signed a pact with the Nationalist Chinese government of Taiwan concerning the island's protection. In 1955, the United States supported the creation of the Baghdad Pact (later to become the Central Treaty Organization — CENTO) signed by Great Britain, Turkey, Iran, Iraq and Pakistan and designed to counter Soviet expansion in the region.

The USSR possessed the atomic bomb as early as 1949, and the strategy of Nikita Khrushchev, Stalin's successor from 1953 to 1964, took account of the atomic factor, focusing on the development of intercontinental ballistic missiles. On 14 May 1955, Moscow responded to the admission of West Germany to NATO by creating the Warsaw Pact, which brought seven Eastern European countries under a unified command controlled by Moscow.

In the United States, President John F. Kennedy and his Secretary of State Robert McNamara favoured the doctrine of flexible response, making it possible to intervene in all sorts of conflicts without immediately resorting to nuclear weapons. One of President Kennedy's first crises erupted in Cuba. In 1959, Fidel Castro had seized power on the island, putting an end to the corrupt and bloody dictatorship of Sergeant Batista. The new regime's left-wing tendencies were of concern to major American industrial interests that were deeply committed in Latin America and very influential in the White House. In July 1960, President Eisenhower, hoping to eradicate the communist experiment at an early stage, reduced to 700,000 tonnes the import quota for Cuban sugar. As might have been expected, the USSR bought the sugar Washington had refused, supplied Fidel Castro with oil and offered to place rockets at his disposal. This support from the USSR reinforced Cuba's revolutionary tendencies, which spread throughout Latin America, where the immense poverty of the masses made communism particularly appealing.

President Kennedy had refused to intervene when anti-Castro forces, backed by the CIA, attempted to invade Cuba in 1961, but when he became convinced in the following year that the Soviets were building missile launching ramps in Cuba and dispatching nuclear weaponry to the island, he asked the Senate for authorization to recall 150,000 reservists and took a series of military measures that clearly demonstrated his refusal to yield to the Soviets. On 22 October 1962, President Kennedy presented Nikita Khrushchev with an ultimatum. Khrushchev finally agreed to repatriate the rockets and dismantle the bases, whose existence Fidel Castro had consistently denied, in exchange for the dismantling of American missiles along the Turkish-Soviet border.

## DECOLONIZATION

Already underway before the advent of the Cold War, the process of decolonization, which led to the end of the world's empires, was undoubtedly one of the major events of the twentieth century. It began in Asia for a variety of reasons, the most important of which, as regards Indo-China and Indonesia, was the fanning of hatred towards Europeans by the Japanese army in the countries that it had occupied, then, after the capitulation, the arming of nationalist movements in the hope that they would oppose the return of the colonizers.

The United Kingdom had been weakened by the war, and this accelerated decolonization in India, but complications soon arose from the Muslim League's determination to secure the establishment of an independent Muslim State. There were riots and massacres, notably in Bengal and Calcutta. Despite Gandhi's efforts and prestige, he was unable to prevent partition. In August 1947, after a round-table meeting, Lord Mountbatten announced the creation of two states, India and Pakistan. As soon as the viceroy and British troops had left, in January 1948, disorder ensued. Gandhi was assassinated by a supporter of the caste system, and tension between the two new countries continued, with both laying claim to Kashmir. The British colonial monolith had been divided into five independent states: India, Pakistan, Sri Lanka (Ceylon), Bangladesh and, after 1947, Burma, which had been occupied by the Japanese.

During the war, Indonesians like Sukarno had collaborated with the Japanese. Rejecting the return of the Dutch, they sought independence. The Dutch Government agreed to a kind of Indonesian Commonwealth in the framework of a Dutch-Indonesian Union, but to no avail. The Dutch then tried to force the nationalists into submission. India and Australia appealed to the United Nations Security Council, which ordered a 'ceasefire'. Fighting nevertheless continued, but the Dutch had only limited military resources at their disposal. On 27 December 1949, they finally recognized the independence of the Republic of Indonesia.

In Indochina, too, the departure of the Japanese triggered a nationalist groundswell of opposition to the colonial power. Ho Chi Minh, the leader of the Viet Minh Communist Party, took over Government House in Hanoi and proclaimed Vietnamese independence. Bao Dai, the emperor of Annam, was obliged to abdicate. The French played a double game, recognizing the Republic of Viet Nam as a free state belonging to the French Union, but at the same time seeking to make Cochinchina, in the south, a separate autonomous republic. The government of the latter was entrusted to Bao Dai and recognized by London and Washington, while Ho Chi Minh's government was recognized by Moscow and Beijing. The ensuing First Indochina War lasted six and a half years, and France sacrificed 92,000 dead, 114,000 wounded and several billion dollars before agreeing to a ceasefire at the Geneva conference. Viet Nam was divided into two along the 17th parallel: to the north, the People's Republic of Viet Nam, and to the south an independent state with Cambodia and Laos lying to the west.

The Americans were slow to realize that the First Indochina War was not simply a colonial war, and eventually discovered at great cost that the expulsion of the French had not improved the situation in South-East Asia in the slightest.

The Bandung Conference, which took place in Indonesia in April 1955, marked a turning point in the history of decolonization. For the first time, Africans and Asians from independent developing countries met to publicly proclaim their unwillingness to be dominated by the great Western powers. The conference was attended by delegates from 29 Asian and African countries, representing one-half of the world's population. They unanimously condemned racism and colonialism, denounced the dangers of nuclear weapons and called for peace. They refused to align themselves either with Moscow or with Washington, a position that would prove untenable.

In Bandung, Nehru had affirmed Asia's wish to assist Africa. The British Government had long ago decided on the progressive emancipation of its African colonies with representative nationalist movements. As early as 1954, it had abrogated the rights conferred by treaty on the British in Egypt, thereby leading to the independence of the Sudan, until then administered jointly by Egypt and Britain. In the wake of these events came the decolonization of the Gold Coast, where Kwame Nkrumah had subjugated the population. On 6 March 1957, in the presence of the Duchess of Kent, Ghana's independence was solemnly proclaimed in Accra. Nkrumah remained in power until 1966, when a military junta overthrew him.

After discussions held at three round tables and marked by a visit from Queen Elizabeth II, Nigeria gained

independence in 1960, but civil peace was shattered seven years later by the war that erupted following the secession of Biafra.

From 1960, decolonization gathered pace. In that year, the British relinquished British Somaliland, which merged with the formerly Italian Somalia. In 1961, Sierra Leone and Tanganyika gained independence. Uganda followed suit in 1962, and Zanzibar in 1963. The situation in Kenya was more complex: London's efforts to seek conciliation led first to a multi-racial government and then to independence. In 1964, Nyasaland became Malawi and Northern Rhodesia Zambia. In the same year, Tanganyika and Zanzibar merged to form Tanzania.

After the Second World War, France, like Great Britain, recognized the inevitability of the emancipation of its sub-Saharan African colonies. For a long time, it believed that the process could take place within the framework of a policy of assimilation 'into the life and institutions of the French community'. In 1956, the French Government passed a law (Loi-Cadre Deferre) providing for representative institutions in the twelve West African territories under its authority and in Madagascar. The initiative failed to satisfy the demands of a majority of African leaders, who proclaimed during a meeting held in Bamako, from 25 to 30 September 1957, that 'the independence of peoples is an inalienable right enabling them to exercise the attributes of their sovereignty in the interests of the masses'. Realizing the shortcomings of the Loi-Cadre Deferre, General de Gaulle, who was recalled to power in March 1958, declared, in a speech given on 24 August 1958 in the sports stadium of Brazzaville, 'Whoever wants independence can take it. The metropole will not seek to prevent it'. A referendum ensued, and only Guinea chose independence, the other countries preferring autonomy within the French Community, which entitled them to receive economic and financial assistance from the metropole. However, the referendum was ambiguous, and autonomy was accepted only as a step on the path to independence, which was rapidly obtained by Congo-Brazzaville, the Ivory Coast, Dahomey, Upper Volta, Madagascar, Mali, Mauritania, Niger, the Central African Republic, Senegal and Chad. Some of these new states were fortunate enough to be led by outstanding figures such as Félix Houphouët-Boigny of the Ivory Coast and especially Léopold S. Senghor of Senegal, who extolled the cultural concept of 'negritude' in his writings.

French policy in North Africa differed from that carried out in sub-Saharan Africa. There were 200,000 Europeans in Tunisia, 300,000 in Morocco and 1 million in Algeria. Whereas France resigned itself fairly promptly to the independence of Tunisia and Morocco, it wished to retain its hold on Algeria. From 1957 to 1960, General R. Salan and his army conducted a war in which the use of torture and collective repression outraged the Catholic Church and many French intellectuals. The Algerian War destabilized France and its army, which was shaken by a failed generals' putsch. General de Gaulle had returned to power thanks to the insurrection of French extremists in Algeria, and paradoxically he ended the conflict by subduing the extremists and granting independence to Algeria in the Evian Agreements of 2 July 1962.

In the meantime, the Belgian Congo was granted independence rather precipitately after a round-table meeting in 1960, but this was followed by a series of coups

d'état, the attempted secession of Katanga, the assassination of Patrice Lumumba (Plate 13), and, the rise to power of the dictatorial General Mobutu.

A series of delayed decolonizations ensued beginning in 1980 with Southern Rhodesia, thereafter known as Zimbabwe, as a result of the unilateral declaration by Ian Smith establishing an independent regime controlled by the white settlers. Decolonization occurred in Guinea-Bissau and subsequently in Mozambique, the Cape Verde Islands and Angola thanks to Portugal's 'Carnation Revolution', which unseated President Caetano, the successor of Salazar. In 1977, Djibouti, the former territory of the Afars and Issas, gained independence. The long struggle against the racist regime in South Africa led to the abolition of apartheid in 1990, and eventually to multiracial elections, from which the former political prisoner Nelson R. Mandela emerged as the country's first black president (Plate 14).

The decolonization process examined by Professors N. A. Simonia and I. D. Thiam in Chapters 4, 5, 6 and 7 of this volume completely transformed the world political map. The number of independent states in Asia increased five-fold, while those in Africa rose from one (in 1939) to nearly fifty. Decolonization, however, did not solve all the problems of the young states. The new Africa, facing formidable difficulties, neglected agricultural development to focus on industrial technologies, most often implanted by multinational firms. This was one of the forms of neo-colonialism that confronted the countries of the Third World with unequal terms of trade. Another form of neo-colonialism resulted from exponentially increasing debt, aggravated by the International Monetary Fund (IMF), which forced governments to impose draconian budgetary restrictions on their people, with dire effects: unemployment, collapse of public services, poor infrastructure maintenance, price increases, currency devaluation, and deteriorating health and education services. A source of rivalry between East and West until the collapse of the USSR, Africa also suffered from Balkanization, as the frontiers between its states were those of the former colonies and seldom those of the different ethnic groups. Some 70 coups d'état ensued, not to mention ferocious outbreaks of genocide in the Great Lakes region.

## THE EXPLOSIVE SITUATION IN THE MIDDLE EAST

The Afro-Asian neutralist movement initiated by the Bandung Conference was reinforced via the Islamic Jakarta-Tangiers axis, which was based in the Near East. Referring to this region, Lenin had declared 'Whoever holds sway there will be master of the world'.

Great Britain had raised the thorny problem of the 'Jewish national home', but being unable to reach a solution to the satisfaction of both Arabs and Jews, the issue was passed on to the United Nations, which, in November 1947, recommended the division of Palestine into a Jewish State and an Arab State. Jerusalem was to be granted an international status. The Zionists were quick to react: on 14 May 1948, the day after the British mandate in Palestine ended, Israel unilaterally proclaimed its independence under the presidency of Chaim Weizmann. The Arabs immediately took up arms but, most unexpectedly, the young Israeli army fought them off and went on to annex the Negev and

West Galilee. Count Bernadotte, dispatched by the United Nations as mediator, was assassinated by Jewish terrorists.

While the states of the Arab League and Israel continued to engage in both covert and open warfare, Great Britain, together with France, the United States and Turkey, requested Egypt to participate in the defence of the Middle East as regional state and co-guarantor. This proposal, which ultimately led to the Baghdad Pact, was categorically rejected by the Egyptians, who also demanded the immediate and total evacuation of British citizens present on their soil.

On 23 July 1952, a military coup led by General Mohammed Neguib led to King Farouk's abdication and the proclamation of an Egyptian republic. In 1954, the same year, Syrian President Adib Shishakli was ousted by a military revolt, and General Neguib was relieved of all his responsibilities and replaced by Colonel Gamal Abdel Nasser. On 26 July 1956, after the United States had withdrawn its offer of loans to build a high dam on the Nile at Aswan, Nasser announced the nationalization of the Franco-British Suez Canal Company. 'More than half of Britain's annual imports of oil came through the canal', recalled the then British Minister of Foreign Affairs, Anthony Eden, in his memoirs. France had not forgotten the considerable support, both moral and material, the Algerian insurrection had received from Nasser's Egypt, and Israel, for its part, was more than willing to take the opportunity to expand. On 26 October 1956, it attacked Egyptian positions in the Sinai Peninsula. Two days later, a Franco-British air force went into action in the canal zone, and parachutists occupied Port Said. The matter was brought before the United Nations by the USSR, which had just crushed a revolution in Hungary and was free to intervene elsewhere, and the United States, in the midst of presidential elections, felt that the adventure was likely to exacerbate feelings in the Arab countries and throw Egypt into the arms of the Soviets. The United Nations General Assembly condemned France, the United Kingdom and Israel, ordered the withdrawal of their forces and decided to send in the United Nations' own forces, the 'blue helmets'. The Franco-British-Israeli forces resigned themselves to withdraw from Egypt, thereby ending a colonial war without resolving the Middle East conflict.

After the Franco-British-Israeli diplomatic defeat in the Suez Crisis, Colonel Nasser assumed the role of the uncontested leader of Arab nationalism and hoped to realize the long-cherished dream of pan-Arab unity. Although he failed in Jordan, where King Hussein, after dissolving his parliament for their pro-Nasser leanings, was rewarded by America, Nasser succeeded in Syria, which united with Egypt to form the United Arab Republic from 1958 to 1961, and in Iraq, where General Qasim overthrew the monarchy.

In 1967, when Nasser barred access to the Gulf of Aqaba to ships flying the Israeli flag, Israel launched a preventive war against Egypt, Syria and Jordan. In six days, Israeli troops took the Gaza Strip, Sinai, the West Bank and the Golan Heights. Once again, the United Nations intervened. Security Council Resolution 242 recognized Israel de facto but required it to withdraw from the territories conquered during the Six Day War. However, the resolution did nothing to improve the immediate situation.

In 1969, Yasser Arafat took control of the Palestine Liberation Organization (PLO) and opted for an ambiguous two-pronged strategy, which consisted of encouraging guerrilla operations while using diplomatic means to promote his position at the international level.

The Palestinian resistance had established itself in Jordan, and in September 1970, King Hussein organized a comprehensive crackdown, forcing 5,000 members of the PLO to leave Jordan for Lebanon or Syria. This prompted certain factions to resort to international terrorism. At the Olympic Games in Munich in 1972, a Palestinian commando – named Black September in reference to the crackdown in Jordan – massacred twelve Israeli athletes.

In 1970, Anwar al Sadat succeeded Colonel Nasser. Two years later, applying the doctrine of non-alignment supported by Tito in Yugoslavia and Nehru in India, Sadat demanded and obtained the withdrawal of the 20,000 Soviet military advisers previously invited to Egypt by Nasser. On 6 October 1973, the day of the Jewish feast of Yom Kippur, the Egyptian army crossed the Suez Canal, and the Syrian army attacked the Golan Heights. Taken by surprise, the Israeli forces were nearly defeated for the first time. During the same period, the representatives of ten Arab states, meeting in Kuwait, used oil as a weapon, doubling the price of the barrel on two separate occasions and exacerbating the crisis already affecting the industrialized world. In the face of this renewal of hostilities, the United Nations Security Council adopted Resolution 338, which provided for a ceasefire, the application of Resolution 242 and negotiations with a view to the establishment of a just and lasting peace in the Middle East.

The Cold War formed the backdrop to this series of conflicts in the Middle East. In order to prevent the USSR from bringing its influence to bear in the region, United States President Nixon instructed his secretary of state, Henry Kissinger, to persuade Israel – the Yom Kippur War having turned to its advantage – to cease hostilities, and Egypt to accept a compromise. In 1977, the United States and Egypt agreed to ask the Israeli Prime Minister Menachem Begin to engage in the negotiations that led to the Camp David Accords, signed in Washington in 1978 under the presidency of Jimmy Carter (Plate 15). According to these agreements, Egypt recognized the existence of Israel, in exchange for Israel's evacuation of the Sinai Peninsula.

If President Carter thought he had laid the foundations for a comprehensive solution to the problems of the Middle East, he was soon to be disappointed. Syria and Iraq called Egypt to task for concluding a 'separate peace' and in 1981 Anwar al Sadat was assassinated by Islamic fundamentalist army officers.

The Camp David Accords had not provided for any solution to the problems of Palestinians living in the territories still occupied by Israel or in refugee camps in Jordan, Lebanon and Syria. It was, in fact, from its bases in Lebanon that the PLO launched its numerous raids on Israel. Intent on putting an end to the raids, Israel invaded Lebanon in June 1982 on the orders of Defence Minister Ariel Sharon, and the Phalangist Christian militia perpetrated massacres in the Sabra and Chatila refugee camps. Under pressure from outraged international opinion, Israel concluded a peace treaty with Lebanon in 1983 and agreed to withdraw its forces, except in South Lebanon, an area still divided among various factions. Syria was standing by.

In Palestine, too, clans and factions were co-existing uneasily when not in open conflict. The PLO opted for moderation and accepted United Nations Resolutions 242 and 338, but many

radicals rejected this approach and joined Al Fatah. Nineteen eighty-seven marked the beginning of the first intifada or Palestinian 'uprising' in Gaza and the West Bank, but the PLO managed to keep the demonstrators under control (Plate 16). At a meeting in Algiers in November 1988, the organization recognized the existence of two states – one Jewish and one Arab – which earned it the recognition of the United States.

To add to the confusion in the Middle East, in 1990 Saddam Hussein's Iraq, which was embroiled in war with Iran during most of the 1980s, invaded Kuwait and bombarded the State of Israel with Scud missiles, posing as the champion of Arab identity and the Arab cause. Israel's refusal to retaliate foiled Hussein's hopes for the formation of an Arab league. The Iraqis were beaten by an international coalition endorsed by the Security Council and directed by the United States, without the participation of Russia. Not wishing to exceed their United Nations' mandate (the liberation of Kuwait), the coalition troops did not march on Baghdad, nor did they support a Shiite uprising, which the Americans had encouraged in the hopes of overthrowing Saddam Hussein's dictatorial regime.

For a while, the Gulf War positively affected the situation in the Middle East. A meeting in Madrid, sponsored by the United States and Russia, brought Israel, Egypt, Syria and Lebanon to the same negotiating table. PLO delegates also took part in discussions as members of the Jordano-Palestinian delegation. The letter of invitation to the Madrid Conference provided for a first phase of bilateral negotiations to be followed by a phase of multilateral negotiations dealing with regional issues, such as arms control, regional security, water, the refugee question, the environment, economic development and other questions of general interest. It was an admirable initiative that remains relevant at the beginning of the twenty-first century.

The first steps were encouraging. In August 1993, Israeli Foreign Minister Shimon Peres met representatives of the PLO secretly in Oslo and together they prepared the groundwork for an agreement on Palestinian autonomy. In September, a declaration on Palestinian autonomy was signed in Washington. The PLO recognized the legitimacy of the State of Israel, while the Israelis accepted the PLO as negotiating partner and declared their willingness to militarily withdraw from the Gaza Strip and Jericho. In September 1995, the Taba Agreement – known as Oslo II – expanded Palestinian autonomy, but the signing of the agreements failed to put an end to the terrorist attacks and suicide missions of Palestinian kamikazes or to the installation of more Jewish settlements. On both sides, fanaticism overruled wiser counsel. In November 1995, Prime Minister Yitzhak Rabin was assassinated by a radical Israeli, and in July 2000 Prime Minister Ehud Barak and Yasser Arafat dug in their heels at Camp David, despite President Bill Clinton's desire for an agreement. Radicals in both camps welcomed the failure of Camp David.

On 28 September of the same year, Ariel Sharon, the leader of the opposition and future prime minister, provoked the indignation of Muslims by paying a visit to the Haram al-Sharif, an Islamic holy place in Jerusalem. Whether deliberate or unintentional, Sharon's defiant gesture triggered off the second intifada, which was more violent than the first and intensified as the Israelis took increasingly repressive action against it. Murderous suicide missions were followed

by no less murderous reprisals. At the end of the twentieth century, few people still talked of negotiations.

## THE COLLAPSE OF THE USSR

The Gulf War had made it abundantly clear that there was only one remaining superpower: the United States. Before the America of President George W. Bush attained a solid potential for imperialism, President Reagan implemented a rearmament policy (totalling 7 percent of the country's GNP) that forced the USSR into military expenditure beyond the capacities of the Soviet economy despite the desire of Soviet leader Leonid Brezhnev to remain competitive with the United States in this field. When Mikhail Gorbachev came to power in March 1985, the situation changed. Hoping to liberalize the communist economy, the new Kremlin leader set out to implement a transitional policy somewhere between outright capitalism and orthodox socialism. Alongside economic *perestroika* ('reconstruction'), his policy of *glasnost* ('openness') was intended to introduce transparency in political and social issues. Press censorship was abolished, and the Supreme Soviet publicly condemned the Stalinist era. In the realm of foreign policy, Mikhail Gorbachev put an end to the Cold War by initiating the talks that led to the 1987 signature in Washington of a treaty in which Americans and Soviets agreed not only to a general arms limitation but to the progressive destruction of their nuclear weapons.

*Perestroika* and *glasnost* spread to the satellite countries in Eastern Europe like a tidal wave. In Poland, where native son Pope John Paul II wielded considerable influence, agitation spearheaded by Lech Walesa's Solidarnosc movement had gained so much popularity between 1981 and 1988 that President Jaruzelski was obliged to agree to free elections. Solidarnosc's landslide victory in 1989 marked the beginning of the end of communist domination. Hungary followed suit by opening its border with Austria, and thousands of East Germans rushed through the breach thus opened to immigrate to West Germany. Erich Honecker was forced to step down as president and, on 9 November 1989, his successor, Egor Krentz, decided to hold free elections. The same evening a jubilant crowd began dismantling the quintessential symbol of the Cold War, the Berlin Wall (Plate 17). Less than a year later, the two Germanies were united. The communist regimes in Bulgaria and Czechoslovakia were the next to be overthrown, but that of Romania ended in a bloodbath. Dictator Nicolae Ceaușescu and his wife were arrested and executed with no semblance of legality. In August 1991, Gorbachev granted independence to the three Baltic States: Lithuania, Latvia and Estonia.

The revolution took an ugly turn in federal Yugoslavia under the Serb Slobodan Milosevic. In the spring of 1990, Slovenia, Croatia, and Bosnia and Herzegovina had announced their intention to leave the federation. Slovenia secured its independence after a ten-day battle with the federal army, but the Serbs managed to occupy a third of the territory of Croatia, which had not yet organized its defence, before a provisional ceasefire was imposed by the United Nations. Fighting broke out again, and it was not until 1995 that the Croats gained the upper hand. Militias on both sides engaged in 'ethnic cleansing'.

Outbreaks of ethnic cleansing increased during the battle for the independence of Bosnia and Herzegovina.

The United Nations and subsequently NATO intervened. In the American city of Dayton, Ohio, in 1995, Serbs, Croats and Muslims agreed on a division between a Croat-Muslim federation, including the war-torn city of Sarajevo, and the Serbian Republic (Republika Srpska). The conflict's death toll numbered 200,000, and more than 2 million men, women and children were forced into exile.

In Kosovo, an integral part of Serbia, Milosevic had arrested the leaders of the Albanian majority in 1989, and put the Serbian minority in control of the province. The Democratic League of Kosovo responded by organizing unofficial elections, which brought Ibrahim Rugova to power in a parallel government. In early 1997, the Albanian resistance rallied behind the Kosovo Liberation Army, and the scene was set for civil war. Serbian politicians and paramilitaries tracked down rebels and carried out massacres in villages suspected of having harboured them. NATO made its position clear by organizing aerial manoeuvres above Albania, thus helping the United Nations to persuade Milosevic and the Kosovan Muslims to agree to a ceasefire on 13 October 1998. The 1,380 observers sent to Kosovo by the Organization for Security and Cooperation in Europe (OSCE) quickly discovered a mass grave crammed with the bodies of the executed Albanian Kosovans. International opinion was as outraged as it had been by the Serbian-led genocides in Bosnia and Herzegovina. Milosevic responded to the NATO delegates who had come to Belgrade to protest by expelling the OSCE observers from Kosovo. The talks held in Rambouillet (France) in February 1999 ended in complete failure. Without UN approval, NATO bombed Serbian positions in Kosovo and deployed troops. Entrusted with the difficult task of supervising the reconstruction of the province and maintaining order, NATO forces have remained in the region to the present day, but the situation in the Balkans continues to be explosive.

## EUROPE'S PROGRESS TOWARDS UNITY

The states of Western Europe assumed some important tasks in the context of the efforts of NATO and the United Nations to deal with the murderous imbroglio in Bosnia and Herzegovina and in Kosovo, but they were bystanders in the diplomatic process, leaving the United States in sole charge of the diplomatic manoeuvring and decision-making. This situation demonstrated that the long march towards European unity had not yet achieved the objective of a common foreign policy.

The starting point was the creation of the European Coal and Steel Community (ECSC) in 1951 by France, Italy, Germany and the Benelux countries (Netherlands, Belgium and Luxembourg). The ECSC was founded with the aim of sowing the seeds of a broader and more integrated community, but the plan for a European Defence Community had been rejected by the National Assembly in France, leading to some consternation followed by a period of reflection. In 1955, the foreign ministers of the so-called 'Six' met in the Italian city of Messina and, on the basis of a report by Paul-Henri Spaak, agreed to re-examine the construction of Europe in the economic sphere. Two treaties were signed in Rome on 25 March 1957: one established the European Economic Community (EEC),

while the lesser-known treaty created the European Atomic Energy Community (EURATOM), devoted to the development of peaceful uses of nuclear energy. The authors of the treaties of Rome also aimed at eventually achieving an integrated Europe, but, as with the plans for a European Defence Community, General de Gaulle was opposed to the idea of a United States of Europe. In 1961, the United Kingdom, Ireland and Denmark applied for membership of the EEC, and Norway followed suit in 1962. True to his reputation as 'a minority of one', General de Gaulle refused to admit these new members, and once again vetoed an attempt at enlargement in 1967. Two years later, under President Georges Pompidou, France finally came around to the views of its five partners, and on 1 January 1973, the United Kingdom, Ireland and Denmark joined the European Economic Community. This was the signal for further enlargement with the entry of Greece in 1981 and Portugal and Spain in 1986, when the membership reached twelve. In 1995, Austria, Finland and Sweden were admitted, bringing to fifteen the total number of members of the European Union, the organization's official name since 1993.

At the Paris Summit of December 1974, it was decided that the parliamentary assembly in Strasbourg would be elected by universal suffrage, and that a European Council would bring together the Community's heads of state three times a year in order to reinforce cooperation between member states. The Single European Act, signed in Luxembourg in 1986, aimed to harmonize national legislation in such areas as taxation, the recognition of diplomas, social law and the right to asylum. The act also stated, albeit in timid terms, that the signatories would attempt to formulate and implement a joint European foreign policy.

The Maastricht Treaty of February 1992 expressed a resolve to continue the process of creating an 'ever-closer union' by enlarging the European Union to include a number of applicant countries emerging from communism and Soviet domination by strengthening the administrative structures in Brussels, and by launching a common currency, to be named the euro, in 2002. The United Kingdom, however, decided to continue using its national currency, the pound sterling. In March 1999, with a view to enlargement, the European Union conferred associate members status on three NATO members from Eastern Europe: Hungary, Poland and the Czech Republic.

Although potentially more powerful than the United States economically speaking, the European Union was not in the same league as the world's only remaining superpower after the collapse of the Soviet Union. Like the European Union, the new Russia was able to make its voice heard; yet even though its opinions were listened to and indeed sought, Russia did not have a decisive impact on the policies of the United States in the world at large.

The same could be said of China, at the turn of the century. Under the guidance of Deng Xiaoping since the late 1970s, the country has resumed sovereignty over the territories of Hong Kong and Macao, whose liberal economies fit in with Chinese reforms allowing for a mixed economy in which state enterprises exist alongside private businesses. However, China's future is challenged by a number of serious problems including social and human rights issues, the independent forces in Taiwan and separatist forces in Buddhist Tibet and Muslim Xinjiang.

## THE SCIENTIFIC REVOLUTIONS

Chapter 13, devoted to scientific development in the twentieth century, shows us that the number of discoveries made after 1940 is ten times greater than all those previously brought to light by humankind. Not only were hundreds of postulates revised or even discarded, rational approaches were undermined by the concepts of relativity and indeterminism. Modest laboratories with two or three researchers were replaced by large-scale institutions with state-of-the-art instruments. 'Big science' required costly and cumbersome equipment, using the most advanced technology. This was particularly true of sub-atomic physics and astrophysics.

In physics, Albert Einstein's theory of relativity and Max Planck's quantum theory had revolutionized concepts of time, space and radiation. Subsequently, Rutherford, de Broglie, Lawrence, the Joliot-Curies, Hahn, Strassmann, Meitner and Kurchatov laid down the foundations for nuclear physics, whose military applications – including nuclear weaponry in the context of the Cold War arms race – went hand in hand with peaceful uses (e.g. the development of nuclear reactors and power stations). It henceforth became possible to produce energy by nuclear fission as well as by thermonuclear fusion, the basis for the hydrogen bomb. If the process of fusion could only be controlled, it could become a practically inexhaustible source of energy.

The laser (an acronym for 'light amplification by stimulated emission of radiation'), an intense beam of light capable of being directed with extreme precision, became operational in 1968 thanks largely to the pioneering work of 1964 Nobel Prize winners Basov and Prokhorov (USSR) and Charles Townes (US). Laser technology led to important innovations both in quantum optics and in solid-state physics (Plate 18). Its many applications included boring though solids, excising tumours, disintegrating kidney stones and measuring distances. A laser beam focused on the Moon illuminates an area less than 2 km in diameter.

Progress in the field of radio astronomy enabled astrophysicists to obtain more detailed knowledge of the properties of stars, and, during the 1960s, to identify radiogalaxies (discovered in 1953) with quasars and pulsars.

The late twentieth century witnessed the construction of large land telescopes, such as the one atop the Mauna Kea volcano in Hawaii that scans the sky of the northern hemisphere, and the European Southern Observatory (ESO) in the Chilean Andes. The Hubble Space Telescope has increased our knowledge of distant galaxies and of extrasolar planets. Today, the field of cosmology, based on theories of general relativity and on astronomical observations, focuses on the structure and evolution of the entire universe. Detailed study of the Earth's structure and dynamics drew renewed attention to the previously rejected theories of continental drift and plate tectonics postulated by Alfred Wegener in 1912. Fifty years later these same theories revolutionized our image of the world.

The natural sciences devoted to the study of man – palaeoanthropology, anthropology, ethnography and prehistory – combined with techniques used in chemistry and physics and with excavations, pushed the emergence of our human ancestors further back in time. The *Australopithecus* skeleton found in Ethiopia, and nicknamed Lucy, is considered to be some 3.5 million years old.

In the twentieth century, biology caught up with physics. Indeed, the history of molecular biology and genetics is something of a saga. Both fields were condemned as bourgeois sciences in the USSR, and met with opposition in the United States, France and Germany. Nevertheless, between 1940 and 1965, scientists working in those disciplines identified the fundamental mechanisms governing the functioning and reproduction of living organisms. In 1944, it was shown that genes were made of DNA, the complete structure of which was described in 1953. Researchers expect to unveil the complete structure of the human genome in the early twenty-first century.

The astounding advances made in genetics and the resulting medical applications raise ethical questions, as they appear to pose a threat to the freedom of the individual. Less spectacular than the above-mentioned breakthroughs, yet equally important, new magnetic resonance imaging (MRI) techniques make it possible to watch the brain at work, and electronic microscopes enable cell biologists to appreciate the complexity of living cells.

As Professor Morange points out in Chapter 13, one of the aims of biology in the twenty-first century will probably be the combination of theories of evolution with developmental biology, molecular biology and cell biology.

Just like the natural sciences, the so-called human sciences made considerable progress in the twentieth century, involving philosophy, psychology, ethics, sociology, pedagogy, the different theologies, and problems affecting the status of women, young people, the elderly and the disabled. Specialists give an account of the progress made in these disciplines in Chapters 8 to 11 and 21 to 24.

## THE CONQUEST OF SPACE

Earth's first artificial satellite was launched on 4 October 1957. The short 'beep beep' sent back by the Soviet Union's *Sputnik I* was soon replaced by the much more complicated signals put out by other Russian and American satellites: *Lunik* 3, launched on 4 October 1959, which photographed the side of the Moon that we never see, and *Tiros*, the forerunner of the meteorological satellites. As the list grew longer, the general public lost interest, leaving specialists to follow new developments in the field.

Indeed, people appeared more fascinated by the exploits of the astronauts: Yuri Gagarin, Guerman Titov, Gordon Cooper and Valery Bykovski, who were joined in orbit by Valentina Tereshkova, the Komarov-Feoktistov-Yegorov trio, and Leonov and White floating in space. The world was waiting for the moment when a human being would set foot on the Moon, and the historic event finally occurred at 10.56 p.m. EST on 20 July 1969, when the two astronauts of *Apollo 11* landed on the Moon. Television viewers around the world could see Armstrong and Aldrin walking on the Moon and planting the Stars and Stripes on its barren surface (Plate 19).

In 1976, *Viking 1* and *Viking 2* explored Mars, apparently completely devoid of life, and found Venus equally inhospitable. The space probe *Voyager 2* set its sights on Uranus after photographing the rings of Saturn.

Despite occasional fatal accidents, astronautics continued, becoming increasingly international in terms of the sponsoring countries and crew members. The construction of the international inhabited space station was a thoroughly

joint undertaking, the different parts being taken into space by a succession of American and Russian vessels.

Meanwhile, hundreds of satellites were being launched for espionage, weather forecasting, radio, television and telecommunications (Plate 20). No sooner had space been conquered than it was threatened with congestion!

## THE INDIVIDUAL BECOMES THE FOCUS OF LITERATURE

As we have pointed out, several avant-garde movements emerged in literature and the arts after the First World War, but this was not the case in the aftermath of the Second World War. It was as if the horrors of the latter conflict, the institutionalization of genocide and the threat of atomic catastrophe called for a different perspective on life and the world. In their introduction to sub-chapter 26.1, Marc Bensimon and Astrid Guillaume point out that after the Second World War, writers were more focused on the individual and relations between individuals than ever before. This was true at the national and regional level and in the context of efforts to eradicate colonialism, racism and all other forms of oppression. These shared aspirations led to an international interplay of influences, and Russian writers such as Ilya Ehrenburg, Joseph Brodsky and Boris Pasternak were accordingly accused by the ruling regime of 'cosmopolitanism'.

Among the abundance of literature produced after the Second World War, works by women on all continents were particularly numerous and noteworthy, owing partly to the emergence and affirmation of women's rights, or, more precisely, to ongoing efforts to achieve equality of the sexes (*see* Chapter 8). Suffice it to cite the following examples: Rina Lasnier and Marie-Claire Blais (Canada), Aïssa Khelladi (Algeria), Emma Bel Haj Yahia (Tunisia), Nadine Gordimer (South Africa), Anita Desai (India) and Yamada Eimi (Japan). Alongside Alain Robbe-Grillet, two women, Nathalie Sarraute and Marguerite Duras, were the leading exponents of the *nouveau roman* in France. When that literary movement ran out of steam, many authors, notably Marguerite Yourcenar, turned to more classical forms of novel and theatre.

Observation of life and the behaviour of the individual led to the philosophical attitude illustrated in the novels and plays of Jean-Paul Sartre, which suggested an existential approach and defined hell as 'other people'. Albert Camus, less pessimistic, believed that humanity was not necessarily a lost cause.

During this period a large number of authors published autobiographies in a more or less disguised form. They included Günther Grass in Germany, Taha Husayn in Egypt and Nirad Chaudhury in India. Another distinctive feature was the impact of colonization and decolonization as found in the works of such gifted writers as Tahar Ben Jelloun (Morocco), Albert Memmi (Tunisia), Léopold S. Senghor and Sembene Ousmane (Senegal).

Sexual liberation advanced hand in hand with the feminist movement, and writers such as Henry Miller, Vladimir Nabokov and Yukio Mishima extended the boundaries of morally acceptable subject matter. An influential twentieth-century voice was English author George Orwell, who warned us of the invasion of the individual's private life by 'Big Brother' – the all-powerful State.

## THE INTERNATIONALIZATION OF CULTURE

One of the most striking features of the development of culture after the Second World War was the move away from the traditional centres of elite culture. In painting, the Paris School that held sway between the two world wars yielded its pre-eminence to the New York abstract expressionists. 'It is not surprising', observes Eric J. Hobsbawm in *Age of Extremes – The Short Twentieth Century* 1914–1991,

> 'that in the 1950s, in the heartland of consumer democracy the leading school of painters abdicated before image-makers so much more powerful than old-fashioned art. Pop artists (Warhol, Lichtenstein, Rauschenberg, Oldenburg) reproduced with as much accuracy and insensitivity as possible, the visual trappings of American commercialism: soup cans, flags, Coca-Cola bottles and Marilyn Monroe'.

In 1957, under the direction of modernist architect Oscar Niemeyer, work was begun on the construction of the city of Brasilia, which would replace Rio de Janeiro as the capital of Brazil. Beginning in the early 1970s, many artists experimented with post-modernism, which was not strictly speaking a movement, but a rejection of the dogmas of international modernism. In architecture, skyscrapers were cheerfully topped with 'Chippendale' pediments and other traditional decorative elements.

The outstanding characteristics of culture in the second half of the twentieth century, under the influence of old and new forms of media – records, tapes, radio, television (Plate 21), video, cable, etc. – were its internationalization and transformation into a mass phenomenon. One can, indeed, speak of the 'cultural industry' when decisions regarding the production, reproduction, storage and distribution of cultural goods and services are made on the basis of industrial or commercial criteria. Thus mass production is based on a marketing strategy that takes precedence over cultural development. However, such a strategy does not necessarily hinder cultural development and, in certain cases, it may even promote it.

In fact, one must marvel at the transformation of the cultural life of the great majority of those living in the West. Less than a century ago, even a very mobile music-lover would not have had the opportunity to hear Beethoven's Ninth Symphony or Bach's Third Brandenburg Concerto more than once or twice in a lifetime in concert halls seating no more than a few hundred. Today, thanks to modern communication technology any work in the concert repertoire can be enjoyed by 250 million people on a single evening. Moreover, each person can listen to the works again simply by recording the performance, purchasing a tape or CD, or by borrowing it from a library.

However, cultural industries do not necessarily have cultural objectives. In fact, the multinationals that have chosen this niche will create a product solely on the basis of global market research. Their initial approach is based on the same marketing techniques as those practiced by manufacturers of washing machines or motorcycles. Inevitably, their production is designed to appeal to average tastes at the national or international level.

As advertising increases and diversifies demand, cultural industries have recourse to symbols, images, ideas, myths and materials that become increasingly standardized, until we end up with what is called 'world culture'. This implies a 'star system' that focuses demand on a single performer and 'prototypes' that form the basis for a series of similar cultural products. This is particularly noticeable in the film and recording industries.

Star systems, prototypes and standardization call for abundant supplies of capital. Only on the international market can one hope to obtain a satisfactory return on the many kinds of investment required by cultural industries. Hence the world-wide distribution of American television serials such as *Dallas*, which premiered in 1978.

It need hardly be pointed out that the more limited a market, the less its aspirations are taken into account, and the 'smaller' the cultural identity, the more vulnerable it is.

## YOUTH, PROTEST AND COUNTER-CULTURE

Youth did not become a field of sociological research until the 1960s. In Chapter 9, François Dubet reminds us that the emergence of new behaviour patterns among young people as a category was one of the social changes characteristic of the twentieth century. Paradoxically, this change occurred essentially in the Western world, where young people were less numerous, more independent and better educated than in other regions.

The first carefully organized revolt broke out at the University of Berkeley, in the United States, in 1964. This time it was no longer the basically passive protest of beatniks dreaming of a lost paradise that could be rediscovered thanks to the heady delights of alcohol and ephemeral love affairs, or of hippies throwing off bourgeois taboos in a drug-induced state. It was a veritable movement.

Massive hippy gatherings such as Woodstock were not, of course, devoid of political content. Through their protest songs, Bob Dylan, Pete Seeger, Joan Baez and other stars had unambiguously opposed the Vietnam War, but they did not directly challenge the established social order, which was not unduly disturbed by their long hair, Indian-inspired clothes and blue jeans. In fact, blue jeans eventually became a mainstream fashion item suitable for both sexes, and particularly lucrative for America's cotton industry.

The Berkeley protesters, not content with deploring the absence of political freedom within the university, attributed it to a conspiracy between academic research, on the one hand, and the government and private industry on the other. Whether they knew it or not, they were propounding the theories of the philosopher Herbert Marcuse (*One-Dimensional Man*), who saw bureaucratic and state-dominated capitalism leading to a technocratic society that would take control of all forms of expression.

In 1966, student unrest crossed the Atlantic, creating disturbances at the Free University of West Berlin. Rudi Dutschke, the life and soul of the movement, was a refugee from East Germany who was dissatisfied with the regime in West Germany. In heaping scorn on liberal capitalism and Stalinist communism in equal measure, he was a typical leftist. The rebels soon diversified by denouncing the family as well as the university. All were now disciples of Wilhelm Reich, who wrote in his book *The Sexual Revolution*:

'The political function of the family is two-fold: (1) it reproduces itself by crippling people sexually. By perpetuating itself, the patriarchal family also perpetuates sexual repression with all its results: sexual disturbances, neuroses, psychoses, perversions and sex crimes; (2) it creates the individual who is forever afraid of life and of authority and thus creates again and again the possibility that masses of people can be governed by a handful of powerful individuals'.

In France, the protest movement led by Daniel Cohn-Bendit was launched at Nanterre University in 1968. Hoping to improve on Berkeley and West Berlin, the French protesters adopted a political stance and considered themselves a French revolutionary avant-garde movement, ready to instigate the overthrow of Gaullist power. After occupying university lecture halls as well as theatres and cultural centres, whose artistic staff willingly joined in, the protesters went on to set up barricades and resort to urban guerrilla tactics. On 13 May 1968, the Confédération Générale du Travail (CGT), a left-wing labour union, called for a 24-hour general strike. Was this the start of the revolution? The authorities were clearly at a loss: government ministers did not even know where to find President De Gaulle. The working class, which had initially participated in the protest by occupying factories, began to dissociate itself from the bourgeois youths and progressively to opt out. The Communist Party and the CGT were wary of leftism, and workers denied Daniel Cohn-Bendit and his friends access to the factories. The adventure had ended in failure, and de Gaulle took advantage of the May '68 'scare' to strengthen the powers of the Fifth Republic.

The period of violent protest in the 1960s coincided with the prosperity of an untrammelled consumer society. The recession of the 1970s was a different matter. Hardest hit by unemployment, young people had doors shut in their faces. Feeling rejected, many of them took refuge in sub-cultures, characterized by reggae or rap music, and sometimes in the violence of the skinheads and the temptations of the extreme right-wing ideologies.

Typically American phenomena included the 'Jesus Revolution' (*Jesus Christ Superstar*) and adaptations of Zen Buddhism. The Women's Liberation Movement and the Gay Liberation Movement soon took root in Europe where they eventually flourished.

The most influential and powerful of all the contemporary leftist movements is environmentalism, although similar ideas were sometimes expressed, albeit less forcefully, on the right of the political spectrum. Leftists have always regarded humanity's arrogant determination to subject nature to its arbitrary and unlimited power and to give economic considerations precedence over respect for the environment as a crime. Be that as it may, the American ecology movement, which was closely linked with Green parties in Europe, gained wide support in the industrialized countries. No longer the preserve of leftists, it became a worldwide movement, bringing about a timely and general awareness of humanity's responsibility towards nature, animals, plants, in short, towards life.

This seventh and final volume of the monumental *History of the Scientific and Cultural Development of Humanity*, like the six preceding volumes, is divided into two sections. In the first, dealing with specific themes, eminent scholars who responded to the call of the International Commission outline

the development and significance of achievements in their respective fields. In the second section, contributors focus on data collected on clearly delimited regions of the world and address issues specific to each region. The volume is completed by a chronological table, an index and selected illustrations.

The twentieth century, which has only recently ended, and in particular the post-1945 period, belongs to what is referred to as the 'immediate past'. The members of the Editorial Board of Volume VII are aware of the risks that this lack of perspective implies for historians and accept the criticism and discussion that the late Professor Charles Morazé foresaw with serenity in his foreword as further contributions to the cultural and scientific knowledge and interdependence of humanity.

# B

THEMATIC SECTION

# I

# THE WORLD AT THE BEGINNING OF THE TWENTIETH CENTURY CRISIS WITHIN IMPERIALISM

*Charles S. Maier*

## ORIGINS AND CHARACTERISTICS OF THE IMPERIALIST ERA

The history of world societies in the twentieth century presents some extraordinary general features, many of them continuations – in intensified form – of nineteenth-century trends. Among those that must strike even the casual observer would be the continuing revolutionary progress of technology – above all the use of non-human energy sources for production, transport and communication but also the great gap between those who benefited from such advances and those vast numbers still performing their agricultural work and manufacturing in traditional ways. In terms of world political organization, the striking characteristic of the beginning of the twentieth century was the extraordinary control that the relatively few technologically advanced societies came to exert on peoples elsewhere (what we commonly term 'imperialism'), and at least until mid-century, the bitter rivalry and destructive warfare between the imperialist powers.

Nor was imperialism the only pervasive inequality. The progress of technology also transformed social relations within states, establishing a particular sort of stratification in industrial societies based on access to scientific knowledge and on control of financial and industrial resources as well as the more traditional ownership of land or high governmental rank. Thus technological advance, the spread of political control over the less economically developed societies by the more advanced, social inequality, and world war were characteristics of an era that is often designated as the age of imperialism. This does not mean that imperialism alone established global inequality or that it made the world wars inevitable. However, these basic features of the era arrived as a historical constellation of forces and relationships. It is difficult to specify their causal interaction and to imagine that they did not impinge on each other in profound ways. In the chapters to follow, we examine their interrelatedness and their evolution.

## THE RESTRUCTURING OF TERRITORIAL STATES AFTER 1850

By 1900, the partition by the imperial powers of Africa and much of Asia as well as the major archipelagos of the Indian Ocean and the South Pacific had just about been completed. After the First World War, the territory of the Ottoman Empire in Asia and the German colonies overseas would be redistributed to other great powers. Increasingly during the interwar years, protest movements in some of the long-standing French and British domains would contest this colonial order. Nonetheless, only after the Second World War did most of the West's colonies achieve independence.

Still, to understand this imperialist world, one cannot simply begin in 1880 or 1890. It is necessary to take account of the great transition in developed state structures that had taken place a generation or two earlier, from the 1850s through the 1870s. The United States – once it overcame the Confederacy's military effort at secession (1861–65) – the states of Central Europe grouped in the German Confederation (1864–71), the states of the Italian peninsula (1859–70), emerging Meiji Japan (1853–68), the British in India after the Mutiny (1856–57), and to some degree, the Mexicans after defeating the French imperial expedition (1862–67), the reorganized Dominion of Canada (1867), and many other societies unified or reunified their state structures in this period. This transition involved transforming, often by force, confederally organized territories into more centralized federations.

The reorganized states applied the new technologies of railroad and telegraph to permeate the national space and establish a greater degree of hierarchic control from the centre. The process involved the social classes that were the agents of technological change, including bankers, industrialists, ambitious civil servants and engineers, who compelled the old governing elites, drawn largely from the landed classes, to share power and office.

The intellectual and governing elites of these cohesive nation-states rapidly adopted the new doctrines of Social Darwinism that inculcated notions of unremitting struggle for survival, not only among animal species, but so-called races and nations, and they embarked on a new period of rivalry and expansion. Once the Crimean War and the wars of Italian and German unification had yielded a new European order, they were soon followed by encompassing alliance systems within Europe and strategic competition to claim territorial possessions abroad. Equally striking was the rapid ascent of the non-European powers that had also undergone modernization. Less than thirty years after the Meiji restoration, Japan defeated the Chinese rapidly in 1895 and fought the Russians to a stalemate after spectacularly destroying their fleet. Three decades after its own long and costly civil war, the United States humiliated the Spanish by its rapid victories of 1898 and divested that long-standing empire of its last colonies, except its Moroccan enclaves.

The European powers (Spain, Portugal, the Netherlands, Britain, and France) possessed colonies since the era following Renaissance exploration. France had already annexed Algeria in 1830. Although for a few decades in the mid-nineteenth century doctrines of free trade had led to relative disinterest in territorial control overseas, by the 1870s and 1880s, the disparity between the power of the technologically advanced states and the more traditionalist and fragmented structures in Asia and Africa invited expansion. The Russians pushed into the multiple jurisdictions in the Caucasus and Central Asia in the 1860s and 1870s. Then, shortly after 1882, Britain asserted

financial control and political influence over Egypt. Bismarck was persuaded to support German colonies in present-day Namibia, Tanzania, and Cameroon by the mid-1880s. Pressed into *faits accomplis* by such ambitious imperialists as Carl Peters in East Africa, Cecil Rhodes in South Africa, and George Goldie in what would become Nigeria in the 1880s, the politicians of the metropoles worked to settle their potential rivalries at the Conference of Berlin in 1884, where King Leopold of Belgium won recognition of the settlements he sponsored as the Congo Free State. An Anglo-French treaty and Anglo-German agreement in 1890 cleared the way for British visions of more extensive settlement and development in the Lakes area (Uganda). British-French rivalry in the upper Niger area and all the way across to Chad led to another convention in 1898, whereupon London found itself consolidating British rule in Nigeria and the French hold on Chad. West Africa was no sooner settled than conflict loomed on the upper Nile and in southern Africa between Rhodes and the Boer Republics. The French gave up claims in the Nile region, acquiring, in return, recognition of their primacy in Tunisia and, in effect, Britain's acquiescence in their right to penetrate Morocco – and ultimately the quasi-alliance of the Entente Cordiale, which quickly developed into a mutual strategic tool for limiting German ambitions in Europe. The ambitious governor of the Cape Colony, Alfred Milner, who supported Rhodes and expansion into the Transvaal embroiled Britain in the costly Boer War. The Dutch-descended settlers were eventually forced to concede defeat but in effect won guarantees for the racialist policies within the emerging Union of South Africa. The process

*Map 2* **Colonial empires in 1914**
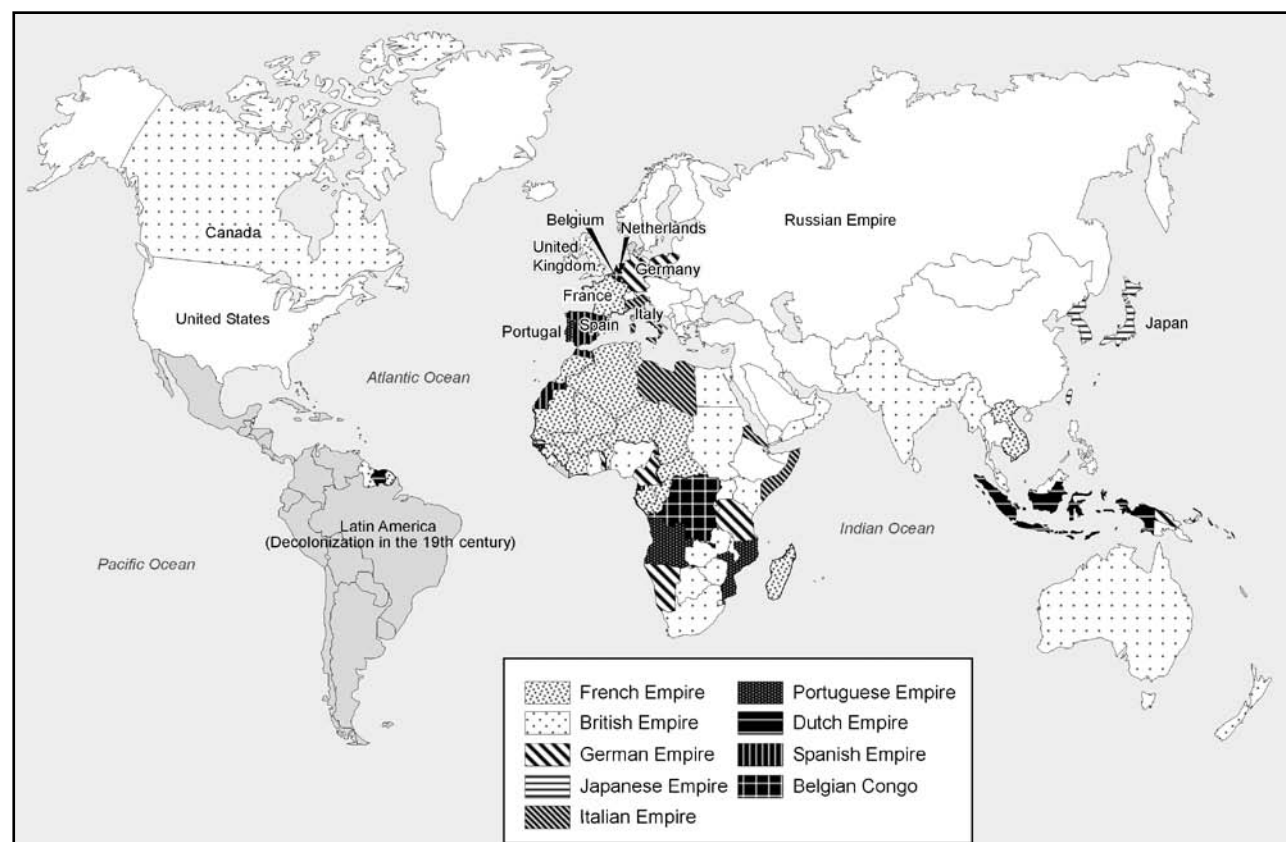


Adapted from R. Chaliand, 1998, *Atlas du millénaire: La mort des empires 1900–2015*, Hachette, Paris.

reveals the underlying historical dynamic of world politics in the forty years before the First World War. While the enhanced power of Western nation-states led to policies of expansion, rivalry, and annexation in Asia and Africa, the conflicts over influence in these regions profoundly heightened the sense of confrontation among European nation-states.

During the same years, the British extended their acquisitions further in Burma, while the French expanded their control over Indochina. The Dutch consolidated their hold over Java, then moved onto northern Sumatra and Bali and the outer islands of 'the Indies'. Although China was too huge and venerable a state to colonize, the European powers forced the weakened Qing dynasty to cede extraterritorial jurisdictions along the coast and in Shandong. Japan would wrest Taiwan (Formosa) and extraterritorial enclaves in Manchuria from China in 1895, and establish the colony of Chosen (Korea) in 1910. The international force sent to subdue the Boxer Rebellion in 1900 served implicitly to demonstrate to China's rulers and citizens the strength of the Western powers and to mutually restrain the Europeans and Americans from unilateral acquisitions. The United States announced its stake in preserving China from partition (the 'Open Door' policy), even as this emerging world player took over Spanish possessions in the Philippines, finally defeating an indigenous resistance movement after several years of struggle. During the same period, the Americans also established a virtual protectorate over Cuba. By 1910, the only scope for expansion was for imperial powers to trade possessions, as in the second Moroccan Crisis, or to take them outright from each other. The Ottoman Empire, losing territory in Europe and lagging economically, seemed the candidate ripest for ultimate partition.[1]

## 'EXPLAINING' IMPERIALISM

Historians have long wrestled with large questions raised by this creation of the imperialist order. What motivated the sudden surge of colonial takeovers? How could such acts be accomplished and then maintained with such small commitments of men and arms? We can rephrase the issues as 'why imperialism?' and 'how did imperialism prevail?' The third question is perhaps even more difficult to assess and to answer: what effects did the experience have on the colonized, and the colonizers? But we shall address the first two questions here and postpone that of imperialism's legacy.

### Why imperialism?

Traditional historians from the imperialist communities have often interpreted this as a question of motivation, and have thus examined the stories and reasons given by the adventurers who set up colonies, the Roman Catholic and Protestant Church representatives who sought to evangelize, the soldiers who sought an opportunity for advancement after the period of warfare ended in Europe, the policy-makers who felt their countries must compete or accept a shameful decline. Justifications, however, are not motivations. One of the major justifications by colonialist enthusiasts was that the colonies provided an outlet for excess population, but these territories were often

inhospitable regions, and few Europeans chose to go, preferring the open societies of North and South America.

The more interesting approach to this question involves examining pressures on policy-makers that transcend individual motivation. We can distinguish two or three major interpretations, each with at least two sub-interpretations. Political historians of international relations, such as American scholar William Langer, argued that in effect the European powers looked to colonial acquisition as part of the continuing rivalry between states after 1870s. Since European space was crowded and divided and even the smallest claims involved warfare, it was natural to project rivalry into the non-European regions that seemed weaker. Since the European struggle was a Hobbesian one, states pressed into new territory – as Robinson and Gallagher later argued (1970) – to protect previous strategic commitments or because they were effectively 'sucked in' by continuing challenges at the latest frontier they had reached.[2] Thus an anti-imperialist prime minister, William Gladstone, found himself persuaded to intervene in Egypt lest the French do so and because control of Suez seemed necessary in light of prior imperialist commitments in India. Once in Cairo, expansion up the Nile allegedly followed because of the resistance that always came from beyond the frontier or the weakness that compelled further intervention. Such an explanatory approach had the virtue of allowing for step-by-step reconstruction of policy-making in the European capitals, but even when it discounted allegedly altruistic claims about teaching indigenous peoples self-government or bestowing Christianity or human rights, it also tended to be apologetic in its denial of any real imperialist agenda. Imperialist actions somehow always arose in response to conditions from the periphery that presented unpalatable alternatives: America took over the Philippines lest the Japanese seize them.

The second set of explanations has focused pre-eminently on the economic disparity between what would later be called the First World and the Third World. Non-socialist radicals Henry Wilshire, John Hobson and later Marxist-inspired theorists suggested that the advanced economies sought raw materials, cheap labour and new markets in the colonies. When it was realized that in fact the colonies – with the possible exception of the huge Indian domain – were unlikely to yield markets, another strand of neo-Marxian explanation was introduced by Rosa Luxemburg and others: namely that the process of capitalism involved a long-term tendency for the rate of profit on investment to fall (since surplus was provided by labour not capital, and as employers had to compete through investment in ore efficient production, they also condemned themselves to declining rates of profit).[3] In this perspective, the colonies might offer higher rates of profit. This insight was elaborated in different ways. John Hobson suggested that the search for profitable investment led to colonial expansion and was ultimately a result of the vast inequalities of wealth inside Britain. Rosa Luxemburg argued that the tendency for the rate of profit to fall under capitalist production necessitated a search for newer and more profitable investment arenas to be sought abroad.

Rudolph Hilferding, trained as a physician in Austria but taking up politics in Berlin, proposed that a unique structural fusion of banks and industries (so-called 'finance capital') made this search for higher rates of profit so imperative in the early twentieth century. Lenin borrowed

from Luxemburg and Hilferding but, writing in the midst of the First World War, examined primarily the investment rivalry in Eastern Europe and suggested that imperialism must be understood as a general stage of economic development inevitably leading to territorial conflict and, therefore, so he predicted, to the chance for revolution.[4]

A later variant on Marxist notions of class conflict – but advanced by analysts who would claim to be influenced by, but not adherents of simple Marxism[5] – suggested that the process of industrialization had unleashed such a sharp degree of class-conflict that manipulative governments chose foreign adventures to take the minds of the masses off domestic claims.

In all these views imperialism had a certain logic or rationality within the terms of the capitalist system. This meant that imperialism might end only with the final transformation of capitalism. Only Schumpeter (1915) claimed that imperialism in fact represented a non-rationalistic or 'atavistic' hold over pre-capitalist aspirations (which the existence of protective tariffs in Central Europe helped to preserve) and that ultimately capitalism would destroy imperialism, a theory similar to that proposed by the Norwegian-American economist Thorstein Veblen.[6] Historians have repeatedly sought to test these theories, finding in general that imperialism did not really 'pay' national societies in aggregate, but that, as Hobson or Schumpeter recognized, it did pay key elites who made policy at home.[7]

Most recently, non-Marxist authors have proposed that the long history of British imperialism is best explained as a result of 'gentlemanly capitalism', which refers to an effort by men of property and culture, less involved with industrial management than with banking and services, to sponsor overseas empire that established them as a patrician elite in a conservative social order.[8] Nonetheless, to this author the political motivations – the fear of international political rivalry marked by arms races, alliances, as well as overseas expansion – seem to have provided the more urgent agenda.

**How did imperialism prevail?**

Why and where did Europeans prevail? How could such small expeditions of Europeans conquer such vast regions and then administer them at such little financial expense? Theories here are less developed. Of course, the European states enjoyed decisive technological advances: gunboats and ships, the latest weaponry. Nonetheless, defenders of autonomy could also acquire at least small arms, and Europeans did meet defeat at the hands of indigenous defenders: the British by the Zulus in the Battle of the Spears (1879), the Italians at Denali (1887) and Avowal (1896). But, in fact, the Europeans also possessed a different sort of resource, which in a broad perspective can also be construed as a technology: that is, the modern state equipped with functionally developed bureaucratic organization, permanent armed forces and obsessed with the notion of frontier and territorial control that the more fluid or even nomadic states had not chosen to develop.

It is too simple to divide states and tribes (which often was a pejorative concept).[9] Africans, of course, had political structures, some very extensive and highly organized, but the states that sent their soldiers and agents into the periphery were of a different order. State structures were unwieldy and sometimes inefficient in modernizing Ottoman Europe or Qing China, in the interior of the Maghreb or 'black' Africa. Often, the states that Europeans encountered (as was the case of the Aztec and Inca empires in the sixteenth century, or the American Indian confederations, Iroquois, Creek, Cherokee, etc., in the eighteenth and nineteenth centuries) were themselves recent creations and, in any case, agglomerations where some tribal units aspired to recover independence in league with Europeans. The Europeans had centralized in the 1860s and drawn on new technological resources for territorial domination, whereas the states they encountered had not made this transition. Where Asians or Africans did undertake similar reforms, they did not succumb. Japan was the pre-eminent example, itself becoming an imperial power. The mid-nineteenth century monarchs imposed a programme of state building on Thailand, which had the good fortune to remain a buffer between British and French colonial territory, as Persia (Iran) did between Russian and British. Elsewhere the very ancientness of dynasties and states sometimes gave them the legitimacy to stand up to invaders, as in Ethiopia until 1935–36 and, of course, China.

## GLOBAL INEQUALITIES AROUND 1900

All in all, however, the imperialist world reflected a high point of hierarchical distribution of resources: political and economic. If we envisage the imperialist world as a phase of world history, as seems proper, then both in terms of economic resources and political power and both within states and between them, the imperialist world of 1900 incorporated a high if not the highest degree of unequal distribution of resources that the world had seen to date.

The historian cannot claim that such differences would not have existed without imperialism. In a Leninist theory, it is precisely the differences of development that give rise to imperialism (which includes economic penetration and foreign investment). The real role of imperialism was to help perpetuate this differential development. By and large, two theoretical stances have contended in trying to explain the outcomes. The heirs to older theories of imperialism – especially the 'dependency theorists' active thirty years ago – proposed, in effect, that Western enrichment depended upon Third World poverty, that some mechanism existed where the poor nations were poor because the rich were rich and vice versa. It was structurally logical for high-wage societies to maintain the poverty of low-wage societies.[10] Such a view found an echo in the United Nations Conference on Trade and Development (UNCTAD), although it was always sharply contested.

Since 1980, with the general disillusion with Marxist theories, more culturally oriented notions have become dominant. Such thinking, perhaps represented most succinctly by the work of such specialists as David Landes and Francis Fukuyama, proposes that a commitment to education, thrift and accumulation, the rule of law and honouring of contracts, and networks of trust, have been crucial for economic development.[11] Obviously, the representatives of poor ex-colonial countries can be consoled by the first view, while those proud of First World achievement enjoy the second. The original notion of dependency theorists that wealthy countries had a stake in

Third World poverty seems unsustainable. However, colonial rulers and investors from wealthy countries often tended to freeze levels of development or encourage activity that autonomous elites might have shaped differently. While the proportion of economically active people engaged in agriculture fell by 1910 to about 5 per cent in Britain and Belgium, about 25 per cent in countries that industrialized but kept significant agricultural sectors active, such as the United States and Germany, and remained from 40 to 60 per cent in the less developed European lands, such as Spain and Italy and in Eastern Europe, the countries of Africa and Asia remained overwhelmingly peasant societies (c. 65–75 per cent).[12] Still, analytically we cannot know what the hypothetical alternative in the absence of imperialism might have yielded: autonomous national development as in Japan, or no development? What percentage of rent from mineral resources might be considered justifiable for the European owners of mines – that prevailing in developed countries or a higher one, if these resources had otherwise lain undeveloped? Ultimately moral criteria and not historical research must be applied to answer these questions.

The inequality between nations was matched by the inequality within nations. Europe was richer than it had ever been, but income, and even more so, wealth was highly concentrated. In many societies and regions – the southern states of the United States, Romania and the Balkans, southern Italy or Andalusia – agriculture remained backward and landlords controlled a labour force of poor peasants, who themselves had often lost their land, remained in almost perpetual heavy debt, or lived as day labourers on the great estates. Political conditions reflected these quasi-peonage societies: landlords could control the votes of the peasantry and trade these electoral supporters for patronage and favour from the capital. Great landowners received enormous revenues from their tenants and often from the rights to coal and other minerals on their territory. In some societies, these distinctions of wealth did not matter in assuring political representation; but in Germany and its states, political representation was skewed according to tax payments, favouring the wealthy. In Britain, where no revolution had redistributed property, the inequalities were the highest in Europe, although America was on its way towards equivalent stratification. Such inequality was perfectly compatible with economic development, advance, and often growing welfare.

Indeed the European societies were initiating the first stages toward what later became known as the welfare state. Bismarck introduced social insurance for illness and old age in Germany in the mid-1880s; he was motivated by conservative calculations and a concern to weaken the advance of the Social Democrats among the growing industrial working classes. The British Liberal government of 1906 enacted similar measures. In France and Catholic countries, more paternalist schemes of social insurance tied to the employer were launched. While the federal government of the United States would not intervene until the administration of Franklin D. Roosevelt during the world economic crisis, some of the states under progressive control introduced regulations for minimal wages and maximum hours. In fact, throughout the European and American world, women's work, as well as hazardous occupations such as mining, were increasingly regulated. Child labour was being eliminated in most sectors.

However, the non-Western world operated by different rules. Whether in the Congo up to the 1880s or in Latin American mining ventures (the Putumayo scandal broke in 1910), Europeans felt little restraint in imposing the harshest of labour conditions. Joseph Conrad captured the 'otherness' of the imperial experience: the fact that almost every abuse of power might be undertaken because it remained invisible (except for the occasional horrifying scandal, such as that of Leopold's Congo, or the atrocities of the German war to suppress the Herrero) and European military adventurers were effectively uncontrolled. Nonetheless, the more pervasive and widespread effects of imperialism were probably subtler than the horror stories depicted in *Heart of Darkness*. Distinctions were made between those supposedly fit to rule and those destined to serve: the presumption was that colonial subjects were childlike and capable of only certain stages of intellectual or administrative attainment, and that colonial development was designed to serve the purposes and wealth and the ego satisfactions of master races far away.[13] To be sure, thousands of missionaries were motivated to found educational and medical institutions. Still, they pursued their work symbiotically with the traders and the politicians. Essentially imperialist apologists claimed that vast areas and populations must wait indefinitely to enjoy the collective autonomy Europeans had come to take for granted since the Enlightenment and French Revolution. In an era that seemed to prize national independence as a supreme human value, the defenders of imperialism maintained that many of the world's peoples were not yet mature enough to claim it.

## CRISES OF THE IMPERIALIST POWERS, 1900–1918

### Two types of empire

From antiquity to the twentieth century, empires have played an ambiguous role in international relations. By subjugating fractious ethnic rivals, they can help ensure regional peace within their borders, but their frontiers remain sites of recurrent skirmishes, and as they decay, conflict becomes endemic. International structures at the beginning of the century included two sorts of imperial systems, and each type was becoming more a source of potential conflict than a guarantor of regional order.

The first and older set of empires comprised the extensive land-based monarchies based on a dominant ethnic group that had subjugated peoples on its peripheries. Nineteenth-century nation building in Western Europe had left the ethnic peoples remaining in the multinational empires restive and ambitious. The Austro-Hungarian Empire included about ten recognized ethnic or linguistic groups, governed in two sub-units: the Kingdom of Hungary and the Austrian half of the monarchy. Within the Austrian half, Czechs, Poles, and Italians contested the Germans' hegemony, and the dynasty sought to represent all the peoples. Within the Hungarian half, South Slavs (Croats, Serbs) and Romanians aspired to more rights, and the national groupings outside the border ambitiously looked to influence their *irridente* within the Habsburg realm. By the late nineteenth century, periodic crises over language and school rights paralyzed parliamentary life.

The decomposition of the Ottoman Empire was even more advanced. During the course of the nineteenth century, Greeks, Serbs, Romanians, and Bulgarians had progressively won their independence. The Ottomans attempted periodic reform in the nineteenth century, introducing some parliamentary institutions, but the reformers, who pressed for more parliamentary government, usually supported a stricter imposition of Turkish national policies as well, provoking ethnic discontent.

The Russian Empire, based on the expansion of Muscovy, included: Poles, Ukrainians, Finns and other Baltic peoples in its western areas; Georgians, Armenians and diverse peoples of the Caucasus; the states and former khanates of Central Asia; Buryats in the east; as well as diverse ethnic groups within Russia proper, such as Germans and Tatars, Bashkirs, Udmurts, Kalmyks among others. As of 1900, Russia was less subject to centrifugal decomposition but was caught up in the rivalries over Korea at its eastern limit and the Balkans on its south-western periphery. China, strictly speaking, was less of a multinational or multicultural empire; although its inner-Asian frontiers included Turkish, Uighur, Mongol and other non-Chinese regions, it faced more serious disintegrative threats along its coastal regions, which Europeans were taking over as their own enclaves – by outright cession, long-term lease, or extraterritorial concession.[14]

The other type of empire was precisely the overseas colonial domains and protectorates cited above. As of the early twentieth century, the problem they presented for international relations was less the restiveness of unwilling subject peoples (although major conflicts took place, especially the United States' campaign to subdue a Philippine independence movement after 1898 and the German campaigns in South-West Africa against the Herrera rebellion) than the competition among the Europeans themselves. The rivalry for overseas empires was one of the considerations that led the Germans to attempt a naval armaments challenge to the British between 1898 and 1910. Colonialism and 'navalism' – now justified by the tracts of the American Admiral Mahan[15] – went hand in hand. Colonial expansion was a stake in the larger strategic competition among the European powers, but it also threatened to make that competition far more dangerous, as the domains available outside Europe for partitioning were successively appropriated. By 1900, most had been carved up, although the Japanese annexed Korea in 1910 and Manchuria in 1931, while the Italians seized Libya in 1912 and Ethiopia in 1936.

Crises over respective colonial domains or conflicting ambitions for potential colonies became more preoccupying. As mentioned above, imperial rivalries shaped European alignments. The French and British confrontation at Fashoda near the headwaters of the Nile in 1898 helped to prompt a rethinking of their relationship. Both powers, after all, were preoccupied by German ambitions, and Britain also watched uneasily as Russia (allied to France) and Japan (its own new ally in the Pacific) moved closer to war over their conflicting ambitions to control Korea. These motives prompted London and Paris to work toward the Anglo-French Entente Cordiale of 1904, designed to forestall any undesired tangles and also to coordinate defensive planning against Germany. The Americans took the Philippines from Spain in 1900; the Germans threatened the French paramount position in Morocco (not formally a colony) in 1905, and again in 1910–11, and the latter confrontation resulted in a frontier adjustment between German and French possessions in Cameroon.

## Alliances, armaments, and origins of the First World War

A distinctive feature of the evolution of international relations after the unification of Germany and Italy was the formation of fixed military alliances in peacetime: the Dual Alliance between Germany and Austria-Hungary of 1879 (enlarged a few years later into the Triple Alliance with Italy, which was less likely to function successfully) and the Franco-Russian alliance (1894), which was a response to the former. Through the 1890s, the ruling British conservatives believed that their maritime supremacy allowed it a policy of 'splendid isolation', but the Fashoda crisis, the German naval challenge and the fact that every other power aspired to the colonial position Britain had acquired made it look for support to Russia in 1902 and to France in 1904. In 1907, the British further interacted with the Russians, their long-standing rival in Central Asia, in order to protect against a conflict over Persia or India and Afghanistan. Effectively, although they tended to deny it to themselves, Britain had been locked into the bipolar competition.

Not only alliances but also significant arms races were involved. Conscription levels were raised in Germany in 1893 and 1913 (bringing the peacetime army to 864,000); the French switched from two to three years of mandatory military service in 1912. Given the fact that young men faced reserve requirements for many years after active service, as well as the perfected logistics of railroads (in the French mobilization of 1914, only 20 out of some 4,300 trains were late), the major powers on the Continent could have approximately two million men at battle stations within a few weeks. Their war plans provided for about half to be deployed rapidly and, in the case of Germany, pre-emptively.[16]

Such military alliances and arms increases might have been accommodated without war (after all the Warsaw Pact and NATO confronted each other with high levels of arms from the 1950s through the 1980s). The problem was that the Ottoman and Austro-Hungarian empires were subject to disintegrative pressures, and the conflicts these created involved links to the new colonial powers. Russia and Japan went to war over their rivalry in Korea, itself a stake for their respective aspirations because China had shown itself so feeble vis-à-vis Japan in 1895. Germany attempted to demonstrate the weakness of the Entente Cordiale shortly after its announcement by an ostentatious demonstration challenging the French predominance in Morocco. The Reich, however, emerged isolated, except for its Habsburg ally, thereby guaranteeing closer Anglo-French cooperation. The European situation became even more unsettled when the Austro-Hungarians, concerned by their own failure to share in colonial acquisitions, decided to annex neighbouring Bosnia, the former Ottoman dependency that the Congress of Berlin had awarded Vienna as a form of trusteeship thirty years earlier. Russia was angered at this unilateral expansion, as were nationalist Serbian circles that aspired to unify the ethnic Serbs of the province. Austria's ally, Germany, compelled Russia to

accept the *fait accompli*. The Italian government, preoccupied by Austria's annexation of Bosnia and anxious to win nationalist public opinion at home, took advantage of Turkey's new difficulties to seize Libya as a colony in 1911. Continuing Turkish weakness led the Balkan states of Serbia, Bulgaria, Greece and Montenegro to conquer the territory of Macedonia, and they soon fought a second war among themselves over the division of territorial spoils. Concerned with the growth of Serbian strength, Austria, in collaboration with Britain, forced a settlement that established the new state of Albania, designed to keep Serbia from acquiring an Adriatic outlet. Consequently, by 1914 the international system was very brittle.

Particularly disturbing were the mutual suspicions of Russia and Germany; each believed itself increasingly vulnerable. Berlin military planners were convinced that the modernization of Petrograd's railroad system around 1917 would facilitate rapid mobilization of Russia's massive army and thus undercut their strategy for dealing with the danger of a two-front war. Influential members of the General Staff contemplated pre-emptive war in 1912 and 1914. Russia was certain that Germany was bent on penetrating the Balkans in league with Austria and propping up the Ottoman Empire. French policy-makers actively reassured their Russian allies that Paris was a reliable partner in case of a showdown.

When the Austrian heir apparent, Franz Ferdinand, was assassinated by Serbian-assisted terrorists in Sarajevo on 28 June 1914, it took some time to understand just how critical the crisis might become (Plate 22). The chief of the Habsburg General Staff was determined to thwart Serbian aspirations, and the more cautious heir apparent was no longer around to argue against the chief's reckless policies. In early July, the German ministers believed that they must show support for their Austrian allies, while German military leaders persuaded themselves that this might be the last chance to take on a huge, modernizing Russian army. Russia, with France's implicit support, was determined that it would not accept further *faits accomplis*. The French president and government felt they had to show full support for their allies' firm stance. By the end of the month, when British leaders had become truly alarmed and sought a joint mediation with Germany, Berlin refused to rein in its Austrian ally. By the first days of August, the continental powers were at war, and to Germany's dismay, the British Liberal coalition decided it could not ignore the obligations it had incrementally negotiated with France. With Britain came the 'White' dominions: Canada, Australia, New Zealand, and even the new Union of South Africa despite some Boer hesitations. India and other colonies had little choice. The Ottomans joined Germany by the end of 1914; Italy attacked Austria the following spring; Bulgaria sided with the Central Powers, Romania joined the Entente and the United States finally intervened on the side of the Entente as an associated power in April 1917. Other countries, notably Portugal, Brazil, Japan, and China, soon aligned themselves with the Allies to maintain goodwill.

## The war's impact on imperialism

What was the relationship of the war to the imperialist international order? Did the overseas empires exacerbate or displace conflict? For a generation after 1870, the nations of Europe had carried out their rivalries by conquests and competition in the 'periphery', i.e., Asia and Africa, but that competition, of course, magnified the overarching sense of Darwinian struggle at home. The war finally resulted from rivalries among European powers largely over European issues. The nationalist aspirations of the peoples of Eastern Europe, many of whom were still included within the land-based European empires, and the limited capacity for institutional reform on the part of the Ottomans, Austro-Hungarians, and Russians, led to continuing conflicts. The old empires ignited the war as they resisted ethno-national pressures, and the war eventually destroyed them.

The war required an unprecedented mobilization of resources: what General Ludendorff called 'total war', such that by 1918 Germany, Britain, and France were perhaps devoting 40 to 50 per cent of their GNP to military uses. On the western front, the Germans' rapidly invaded Belgium and France with devastating casualties, but after failing to reach Paris, the two sides dug into trenches that remained largely stable (although heavily and disastrously contested) until the great German offensive and subsequent retreat of 1918. Almost one man in four between the ages of 18 and 40 would be killed among the French military. The toll on Germans was slightly lower, but a higher number of men were killed (1.3 and 1.8 million respectively). In Eastern Europe (outside Serbia), the percentages might be lower, but this resulted from the fact that the armies were not frozen into fixed entrenchments and huge numbers of troops were captured en masse.

The Russian Empire collapsed first. Its massive armies enjoyed a few weeks of initial success in East Prussia, then committed some disastrous strategic errors and suffered a major defeat at Tannenberg. German and Austrian victories forced withdrawals in Galicia (a region in present-day Poland and Ukraine) in 1915, and the military recovery under General Brusilov in 1916 could not be sustained. Troops fought stolidly but with inferior equipment. While improved in 1916, industrial support was deficient. Motivation flagged as retreat continued, and with surprisingly little resistance, the prospect of mass mutiny led to the tsar's abdication and the declaration of a republic in the 1917 revolution. In the confused conditions of wartime Petrograd and the sudden political competition, the provisional government lost almost all authority. Its decision to continue the war effort along with its allies cost it major support. Returning from exile, the Bolshevik leadership established its authority in the factory councils ('soviets') as well as in the workers and soldiers councils, while the reformist socialists (Mensheviks), the professorial Liberals, with limited support in middle class and professional circles, and even the would-be representatives of the peasantry, the Social Revolutionaries of Alexander Kerensky, could not establish effective political control. Having maintained the most radical anti-war position, the Bolsheviks knew what they wanted, and seized power in a *coup d'état* in the so-called October Revolution, in which a party with hitherto a weak position took precarious control of the Russian State. Dissolving the recently elected Constituent Assembly in which they had only about a quarter of the delegates, the Bolshevik leaders skilfully announced a new International to win support abroad for an attractive programme of immediate land redistribution to the peasants, and peace without annexations. The new regime accepted huge cessions of the former tsarist realm in Eastern Europe to make peace with Germany, and mobilized

supporters in what became a brutal civil war on multiple fronts. Despite Western support for their adversaries, the Bolsheviks prevailed by 1921. Hand in hand with the most exalted promises of world proletarian revolution came the organization of an effective secret police, the Cheka. Opposition parties and eventually the competing factions of the revolutionary front were successively suppressed. Lenin was ruthless toward opposition, but also understood that in a period when violence had become a worldwide phenomenon, the rhetoric of liberal politicians was limited. To win the civil war, he announced war communism, resorted to class warfare in the countryside, requisitioned property. He ostensibly promised self-determination to the diverse ethno-national components of the empire, which for several years became arenas of struggle on their own before being safely centralized again within the reorganized Union of Soviet Socialist Republics.

The Ottoman and Habsburg empires also collapsed under the massive strains of war and economic hardship. The Habsburg armies held up surprisingly well, if assisted by German cadres, but as the Central Powers went into retreat, the empire finally decomposed and the various national leaderships declared independent republics. In Turkey, the Sultanate was left isolated in Constantinople, while Mustafa Kemal's Turkish nationalists seized control in Anatolia, replacing the old regime by 1922. While the German Empire was more of a nation-state, it too collapsed with defeat. The land empires in effect disintegrated.

However, the First World War did not achieve the formal independence of colonial regions overseas. Decolonization was to be achieved only after the Second World War. The situation of the extensive and populous areas of the world still held in colonial dependency was fraught with contradictions after 1918. The ideology of the victors centred on the concept of self-determination – for Serbs, Poles, Czechs and Belgians, but not for colonial peoples. According to British and French imperialist doctrines, colonial subjects would be ready for self-rule only after an indefinitely long period of 'preparation', either through indirect rule by cooperative Christian-educated university-trained indigenous elites, or through inculcation with the French republican values that Paris propagated. But that time was still far off.

No matter how devoted American policy-makers were to Wilsonian ideals, they were hardly prepared to recognize their relevance for the Caribbean and Central America. And the Japanese leaders, who had pursued an imperial agenda since taking Formosa (Taiwan) in 1895 and Korea in 1910, sought to exploit their country's intervention on the Allied side in the First World War to establish their country as the dominant power in Manchuria and the Shandong peninsula at a time when northern China succumbed to fragmenting successor battles after the collapse of the Qing Dynasty. Although Western objections helped China resist Japan's Twenty-one Demands for a protectorate, and the Chinese claimed a place at the Paris Peace Conference by joining the coalition against Germany, the 'Big Four' negotiators still awarded Japan control of the former German possessions in Shandong. Angered by this dismissal of their own country's national rights, Chinese students and protesters organized a huge protest – the 'May Fourth Movement' – against foreigners and the weakness of the fragmented Chinese regime. Still, Western recognition of Japan as a major Pacific naval power helped Tokyo

pragmatists maintain decisive power at home through the 1920s and postponed a war for hegemony in the Western Pacific.[17]

The First World War had clearly shaken the premises of colonial rule. The British and the French had brought the indigenous peoples of their African and Asian domains to assist in the Great War: Senegalese troops served in the French occupation forces in Germany; Indian army units had fought in the Mesopotamian campaign against the Turks. The Indian Army was expanded to two million men, and the country was taxed and subject to war loans to pay for their upkeep. Labour battalions recruited from Egypt and the West Indies, or hired on a contract basis from China, built railways, supply depots and unloading ports in France. Colonial subjects who travelled to the theatres of war (or fought themselves in the African and Ottoman campaigns) were plunged into a world where whites no longer presented a united front, as they had during the Boxer Rebellion, but were visibly bleeding each other to death. They were sometimes introduced to Marxist ideologies of pacifism and other underground ideas of anti-war protest. Even when they remained resistant to unrest, they then had to return to their galling subaltern roles in the colonies.[18]

Moreover, Woodrow Wilson and America's role briefly crystallized an almost messianic sense of expectation among many spokesmen for the working classes and for independence worldwide. The Paris Peace Conference was fraught with the sense of a transformed world order, and the representatives of Korea, China, Egypt and many other hitherto colonized nations expected the situation to be redressed.[19] The colonial economies, meanwhile, had been infused with new vigour as the belligerents called for raw materials and manufacturing. Colonial areas were not immune to the waves of working-class and revolutionary unrest that surged throughout the world from 1917 to 1921. In India, above all, the Congress Party had already put self-government on its agenda, and a vigorous labour movement had emerged. Protest movements and strikes were renewed. Nonetheless, colonial authorities were determined to maintain 'order', and the movement ran its course, with several incidents, the bloodiest of which occurred in April 1919 in the Punjabi city of Amritsar, where the heavily armed British commander killed nearly 400 and wounded 1,200 Indian protesters who had rallied in a local stadium.

The victors in Europe, in short, were not prepared to relinquish their domains. The key to the peacemaking process outside Europe was not imperial divestiture, but sufficient agreement on joint approaches by the colonial powers and appropriate redistribution of German or Ottoman possessions to make future conflict unnecessary. By 1916, the French and British had agreed that they would divide Ottoman possessions in the Middle East after an Allied victory. The French, who had long-standing commercial and religious interests in the Christian and Druse settlements of Lebanon and the north-western part of Mesopotamia, were awarded territories south of Turkey, which they divided into the two 'mandatory' republics of Lebanon and Syria. Further to the south along the Mediterranean and extending eastward across the Jordan River, the British took over Palestine and the newly established Kingdom of Trans-Jordan. They also received the long sweep of 'Mesopotamia' from the Persian Gulf to

Syria (to be reorganized as Iraq), making sure to retain the oil-rich area around Mosul.

To reconcile abstract Wilsonian ideals with the colonial appetites that the war had enhanced, the new League of Nations was empowered ostensibly to assign the redistributed German colonies as 'mandates' to the existing imperial powers: France and Britain in Africa, Japan and the United States in the case of Micronesian island possessions. Called on to ratify partition agreements made among the major powers, the very organization that promised a peaceful world order could thus be exploited to sanction a new lease on life for European colonialism.

Organizing political authority in these regions remained a somewhat improvisational task. The British recognized the independence of the Bedouins of the Hejaz, who under Sharif Husayn had thrown in their lot with Britain against their nominal Turkish overlords. Although Husayn's ambition to be caliph of the Arabs did not long survive the war, one of his sons was installed as leader of Iraq, while the other was awarded Trans-Jordan. London retained direct administration of the remaining western area of Palestine, where they had somehow to reconcile the interests of Zionists – who had been promised a Jewish homeland by the Balfour Declaration of 1917 – and resident Arabs. In the Arabian Peninsula, where an eighteenth-century revivalist movement had brought the house of Saud to power, the hereditary leader Ibn Saud consolidated the interior territories, conquered the Hejaz by 1925–26, and in 1932 proclaimed his domains the Kingdom of Saudi Arabia.[20] Egypt continued as a kingdom under British protection; like India, it had become an important economic component of the imperial textile industry. Thus London had acquired a vast domain of semi-autonomous protectorates, theoretically ruled by the newly inserted institution of monarchy, but in fact governed by a fitful alliance of influential families and London resident authorities. The Dutch retained their rich possessions in 'the Indies'; the Union of South Africa took over German South-West Africa (Namibia) as a mandate. The French set out to consolidate their influence in Morocco, Lebanon, and Syria and to win over the Syrian elites. For both France and Britain, the training of indigenous military units was a key task.

The demands of the First World War revealed how useful a role loyal colonial forces might play. Indian forces had been critical in the Mesopotamian campaigns; Senegalese formed part of the post-1918 French occupying force in Germany. The armies also offered a channel for training key elites and inculcating a sense of belonging to an overall colonial mission, but positions of command remained reserved for the Europeans. Could the loyalties engendered among the colonial elites overcome the enhanced ideologies of self-determination? After indulging in four years of unprecedented organized violence against each other, could Europeans truly reconstruct a united front to rule so many non-Europeans, especially when their rivalries had contributed to their sanguinary conflict? And after expending so many of the resources offered by the colonial world for that cause? Far-sighted statesmen in Europe as well as nationalist leaders understood that the system had to evolve, but the wager for the colonial powers was that some new form of association that would preserve their cultural and economic ascendancy might painlessly emerge. Had they not been so embroiled among themselves in the wake of the First World War, they might have had a better

chance. Once the upheavals of 1919 were suppressed or dissipated, however, the imperial order seemed to have acquired renewed lustre. Empires existed on borrowed time, but even that would eventually seem intolerable to those who were asked to wait.

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# 2

## STABILIZATION, CRISIS, AND THE SECOND WORLD WAR

*Charles S. Maier*

### PROLONGING COLONIAL RULE

As before the First World War, events in Europe had a direct influence on the colonies. Imperial control was more extensive but also more precarious. The inter-war phase of European domination involved a race between reform and rebellion. Progressive Europeans hoped for gradualist co-optation of local elites in an effort to forestall real independence, but by the inter-war era, they had to deal with the growing impatience and skills of a new generation of politicized and educated indigenous leaders. Right-wing European critics of colonial reforms correctly predicted that continued concessions would only lead to increasing pressure for independence. But their only alternative was the recourse to force. Ultimately the British would recoil before the violence that would have been required, while the French accepted it (after the Second World War), only to find that their own society was brought to the edge of civil war.

As the threat of aggression from Germany, Italy, and Japan grew far more menacing by the mid-1930s, London's military resources – the ultimate coin of empire, even if rarely spent – were stretched very thin. Troops were required for security in Europe, initially in Ireland, in Palestine and the Middle East, and eventually South Asia. The duration and demands of the First World War had already made London dependent on the reserves of wealth and manpower contributed by the self-governing dominions and also on the financial support of the United States. In Britain's major possession, the Indian subcontinent, further cessions of authority to the nationalist movement were virtually inevitable. British reforms announced in 1917 and formalized in the 1919 Government of India Act began a partial movement toward self-government within the Raj. Under a notion of diarchy, education, agriculture, and health were to be devolved upon provincial legislatures elected by Indian constituencies. Revenue, law, and order were to be reserved for the vice-regal government.[1]

The British were not prepared to relinquish India between the wars, and the movement for self-government in India (the National Congress) still believed caution was required. In the wake of the Amritsar massacre, Mohandas Karamchand Gandhi, the remarkable ascetic 50-year-old leader of resistance, moved in late 1920 to transform the Congress Party into a more effective mass organization and initiate a campaign of civil disobedience – non-cooperation – for the sake of self-rule and ultimately independence (Plate 23). Social pressures added to nationalist grievances. Wartime provisioning requirements for the large Indian army had stimulated Indian textile and other industries in Bombay, Madras, Bengal and elsewhere. Overarching potential urban and rural class conflicts were the fundamental fissures of the huge articulated set of communities that constituted India: the gap between the untouchables, whom Gandhi insisted must be included in the Congress to the instinctive repugnance of upper-caste leaders, and the division between Hindus and Muslims, led in the Congress by Mohammed Ali Jinnah. The more urgent the demands for national independence, the more fissured the subcontinent appeared. British resistance to further reform after the dominion proposals of the abortive Simon Commission led to a five-year campaign of civil disobedience from 1930 to 1931, including a dramatic march to the sea to protest the salt tax, and again after 1932.

An Indian nation had to emerge, but when, and what cohesion might it possess? The final pre-war British answer was the Government of India Act of 1935, the upshot of initial Round Table Discussions with Indians in 1931–32. It envisaged a federal dominion when half of the princes (subject to the Raj but ruling a quarter of the population) might agree and, in fact, served as the basis for the post-war constitution. But until ratification by the princes, power would remain with the Viceroy. Meanwhile the British governed the congeries of princely states, crosscutting sects, occupational units, communities, and held on to decisive power.[2]

India was the largest of Britain's imperial possessions, but the others gave just as much trouble. The inability to reconcile Ulster Protestants to Irish autonomy led to continued violence between the uprising of 1916 and the partition treaty of 1922. Egypt saw nationalist rioting in 1930 and 1935 although Egypt was nominally an independent kingdom and received League of Nations membership. Iraq achieved independence in 1932, and the Kurd-Sunni-Shiite

divisions that have dominated headlines since 2002 took their toll in the early 1930s as well. In mandatory Palestine, Arabs revolted against Jewish migration in 1936, and only appeasement policies in Europe allowed London to deploy the needed troops to quell the uprising, although Britain acquiesced to Arab pressure to limit Jewish immigration at a time when brutal Nazi policies had made the situation of German Jews pure torment.[3]

Given the military and administrative expenses, was maintaining a colonial empire still worth the effort? Of course, a few left-wing protesters aside, Europeans still believed it essential and on several grounds. It testified to strategic supremacy for the metropole despite the armed forces that had to be garrisoned abroad if not actually engaged in endemic fighting. It rewarded a powerful network of elites at home. It promised safe control of vital resources, including petroleum for the British and rubber for the French. The Dutch continued to develop the oil and mineral wealth of their vast Indonesian archipelago. Secured at bargain prices, the bounty of the Third World – oil and rubber and cotton, tobacco, copper and precious metals – compensated for the wartime squandering of wealth in the First. Colonialism also reaffirmed the cultural or 'civilizing mission' of Europeans after the terrible lapse of the First World War. European administrators trained native civil servants, organized education, and selectively interpreted the social and cultural worlds that they sought less to penetrate than to keep under control. The transactions of everyday rule in the empire profoundly influenced the colonized country, but also the colonizers. Young men of the metropole found themselves possessors of an unsettling power that offset the dull daily tasks of rural administration; servants abounded without real cost; and youthful idealists could construct a humanitarian and ethical vocation among their subjects abroad.

It is an open question whether capitalism reinforced or finally weakened the structures of colonial domination. International economic exchange built on and helped to perpetuate the unequal relationships of metropole and colony, the latter as source of commodities or relatively cheap labour. But industrial unrest was a prevalent feature of inter-war colonialism, as indigenous labour, uprooted from a crumbling village structure (as it had been in Europe the previous century), continued to migrate to the mines of Katanga or Witwatersrand, the port of Mombasa (Kenya), the textile factories of Cairo or Bombay.[4]

Since the cause of the working class had also become a major ideological theme of European political activists, these developments created an opposition to colonialism at home. The Second International had condemned colonialism before the First World War. The communist parties took up the issue after the First World War, and it remained one of their fundamental themes until the 1980s, when Soviet armies were mired in Afghanistan. Moscow's own control over its Central Asian, Ukrainian, or Baltic peoples never seemed to involve any of the same issues. The more overseas colonies were integrated into a world economy, the more their fate was caught up in the divisions of domestic politics.

Colonial domination could not have been preserved forever. The French, the British and the Dutch were divided among themselves as to how much self-governance they could encourage. For every far-sighted and cultivated colonial administrator who advocated expansion of

'indigenous' autonomy, there were conservatives whose policy, in the words of one French governor general in Viet Nam, was 'surveillance, punishment, repression'.[5] Still, the system broke down when it did because the colonial powers could not stabilize their own peaceful order after the First World War, and descended toward renewed and even more destructive warfare. The whole structure of inter-war European political reconstruction depended upon a fragile prosperity. Once it fell apart, and once, too, nationalist and fascist regimes came to power in Europe (and in Japan), renewed large-scale warfare would have been hard to avoid. The First World War had already created the conditions for nationalist movements to advance in the colonial world. The Second World War made their rapid success far more likely.

## THE WORLD ECONOMIC CRISIS AND THE VULNERABILITY OF DEMOCRACY

Even before the Great Depression, the more fragile democratic regimes in Europe had already collapsed. The Hungarian revolution of 1919 was suppressed by a military counter-revolution that installed an authoritarian (if nominally parliamentary) regime in that country, so reduced in size by the Treaty of Trianon. Spain and Italy abandoned liberal-democratic institutions in the 1920s; Poland's military began to curb parliamentary power.

But the world economic crisis of the 1930s made democratic prospects far worse. The prosperity of the late 1920s, promising as it appeared, rested on a very fragile foundation and was vulnerable to key policy failures. For it was based on an effort to restore what was an oversimplified interpretation of how the international economy ran before the war. Before 1914, the major world economies had adopted the so-called gold standard, which seemed a prerequisite for membership in the civilized world. The gold standard provided that the subscribing countries' central banks promised to redeem their national paper currency in gold. This meant in effect that no participating country could accumulate significant deficits on current account or pile up import surpluses beyond the values of what it exported or borrowed from foreign investors. If it continually spent more than it earned from abroad, holders of the country's currency and bonds would supposedly worry about the real value of the paper assets they held and would run down the spendthrift nation's gold reserves, supposedly forcing a hike in its interest rates and an offsetting contraction of foreign purchases. The beauty of the system was that it supposedly kept an international equilibrium automatically. In effect the Bank of England was the linch-pin of much international exchange (although the French franc and German mark played large roles in Eastern Europe), and despite vast foreign expenditures, the Bank of England kept the pound sterling at its pre-announced gold value.

The income that Britain received from foreign investment and its positive balance of trade with its colonial possessions, above all India, offset its negative balance of trade with Europe. Returns from outside Britain minimized the deflationary adjustments at home that might be required to maintain the country's extensive foreign investments and confidence in the pound more generally. What is more, London actually could shift the real costs of monetary adjustment onto the countries that held sterling. The

First World War, however, shattered this world, which seemed to guarantee international financial equilibrium so painlessly and automatically, but which in fact was already finding it more difficult to operate without central bank intervention even in the last years of peace before 1914.[6]

The post-war years saw no easy restoration of world trade. Russia, which had been a major purchaser of Central European goods and a provider of grains, timber, and other materials, plunged into the economic misery of civil war, hyperinflation, and isolation. The successor states to the Austro-Hungarian Empire also became a depressed area; the former internal trade of the Habsburg Empire was now fragmented by new frontiers and hostilities. Stagnation meant that urban areas no longer could absorb the excess labour of the countryside. And whereas hard-pressed peasants of Eastern and Central Europe and southern Italy had also migrated to the Americas in record numbers from 1890 to 1914, they could no longer do so after war broke out. In 1924 the United States, caught up in a cycle of xenophobic reaction to its earlier openness, passed the Johnson Act, which virtually shut its borders to Eastern Europeans.

As wartime demand slackened, most economies underwent a short but very sharp recession in mid-1920 and 1921, triggered in some cases by a rapid cut in expenses as states sought to return to normal financial conditions. In 1922, in the United States prosperity returned and the Americans entered a vigorous seven-year expansion. But all industrial economies remained subject to business cycles: vigorous investments and demand usually declined after seven years of expansion.

The problem was even deeper, in fact, because of the war's wastage of savings and capital. During the war, countries had not renewed industrial infrastructures and had indirectly taxed national savings by cumulative price increases through two- or three-fold ablative inflation. Nations had also gone heavily into debt; some of this debt was internal and owed by one citizen or bank to another and thus would be settled by internal redistribution of wealth usually at the cost of those on pensions or rents or other fixed income. But, in addition, Britain, France, and Italy owed significant war debt payments to the United States, while Germany owed reparations to Britain, France and Belgium. Moreover, each country had lost significant foreign assets whose earnings had helped offset the cost of imports: Britain had sold off about 25 per cent of its foreign portfolio. The relatively easy burden of international exchange and debt before 1914 became far more oppressive in the 1920s.

When Britain and other countries 'returned to gold' between 1925 and 1930 (or more precisely adopted a gold-exchange standard where dollars could also serve as a reserve), most felt the need to raise prevailing interest rates in order not to lose reserves. However, the tight money policies of the late 1920s inhibited investment in Britain and exacerbated labour relations in Germany. Britain had revalued the pound at a rate that meant its products were relatively more expensive than those available in or from America, thereby producing an extra burden on its balance of payments. With the United States now a net creditor nation, any American failure to 'recycle' dollars to Europe would add to the deflationary pressures. Americans poured their savings abroad into all sorts of European loans, some for productive investments, others for public amenities. Many of these loans were short-term and had to be frequently renewed. In addition, once the stock market began to climb rapidly at the end of the 1920s, American investors tended to borrow to buy Wall Street securities, not Central European bond issues. Once the American stock market plummeted in 1929–30, with its huge contraction of American wealth (since so many individuals and banks had tied up their credit in the market), American savings were no longer available.[7]

Democratic politics in the new countries of Central Europe was linked to prosperity, which was rapidly vanishing. Over the next three years, unemployment would rise to catastrophic proportions: perhaps over 25 per cent of the work force in the United States and Germany. The national output of countries slumped badly. In Germany and the United States – the hardest hit industrialized countries with reliable statistics – GNP descended to about 60 per cent of 1929 levels by late 1932, at which time the statistics were bottoming out in Britain and Germany. But hard times were spreading to France and Spain.

Although we think of the Depression in terms of industrial unemployment, it brought great suffering as well to rural communities. Vigorous demand and rising prices for agricultural products brought vast expansion of output and then a collapse of prices from 1920s to 1930s. Bumper years sent grain prices skidding in 1927 and 1928; they did not recover in 1929 and as grain suppliers sought to dump their stocks, prices fell to three-fifths of the 1913 level by 1932. Only by the thirties did interventionist governments, whether of the left or nationalistic, introduce national marketing boards that could control sales and pay farmers to curtail output.

The fate of agricultural producers was thus as harsh as those of industrial workers. Since the family farm could not 'fire' its old parents and numerous children, or export its excess young working adults to cities without jobs, it left them to stagnate without shoes, clothes, schooling, medicine, housing, urban manufactures, and even clean water or an adequate diet. Outside Britain and Belgium, industrial countries still retained large rural populations – up to 50 per cent living in areas defined as rural in the United States, about 25 per cent on farms in Germany. In addition, most of the rural population outside Europe, the northern United States and Canada, or coastal and Great Lakes North America was overwhelmingly composed of peasant producers, usually dependent upon costly loans from seedtime to harvest. Hard-pressed farmers switched their political allegiances – many voting Democratic instead of Republican in the United States by 1932, but in Germany defecting en masse to the National Socialists by 1930. The Democrats seemed to promise cheap money and credit, and the Nazis promised security of farm tenure and even higher tariffs and protection than already existed. They also handily blamed Jewish creditors for the woes of farmers.

Other commodities underwent the same passage from boom to bust, and as peasants suffered, political turbulence grew. Coffee bean prices declined by 75 per cent from 1927 to 1931, helping to open the way to the Brazilian dictator, Getulio Vargas. The rubber plantations that had boomed in South-East Asia (as increasing numbers of automobiles spurred the need for tires) saw prices collapse, helping to provoke nationalist resistance movements. The collapse of sugar prices brought misery to Indonesia and hardship to the Caribbean. The collapse of silk prices meant greater

poverty for two-fifths of Japan's farmers, and aggravated the discontent of many Chinese peasants, who would undermine the precarious control of the Chinese nationalist government. The prices of some crops fell dramatically even though demand remained relatively stable: the price of cotton decreased by two-thirds. The response varied: silent suffering or acceptance of wage labour, flight and migration, occasionally open rebellion. American tenant farmers in the southern states, i.e. sharecroppers, dependent for yearly credit on landlords who controlled the payback of 'settle' they finally received, remained in misery and increasingly compelled to switch their peonage into wage labour.[8] African-Americans would eventually accelerate their migration to the industrial cities of the North once urban factories began to revive. Egyptian peasants, also dependent on a cotton monoculture, cut back their consumption of food grains by a quarter.

In South-East and East Asia, the price of rice fell 50 per cent even though consumption hardly fell. The results were rural immoderation in Japan, the rise of prostitution, a new resentment of the city and of recent trends toward liberalization, and a symbiosis of distressed peasants and a belief in the saving role of the military. If German peasants looked to the National Socialists, the Japanese put their trust in militarist values. Where white colonial authorities reinforced local landlords, peasant rebellions were a possibility. Vietnamese peasants revolted unsuccessfully as the authorities sought to collect taxes in the face of collapsing rubber prices. By the end of the 1930s, South Vietnamese landlords had largely supervised a switch from tenancy to wage labour (a trend also underway in the cotton South of the United States), whereas peasant tenancy remained more resilient and resistant in the North. In Burma, continued collection of poll tax payments as rice prices collapsed triggered a rebellion through 1931–1932, which British rulers put down only with difficulty. Whether in South-East Asia, West Africa, the Dutch Indies or the Middle East, the mid-1930s were to prove the point of inflection for European colonial rule. That is, mobilization of labour and peasants and intellectuals that achieved decolonization after the Second World War really 'took off' in terms of organization and protest during the 1930s.[9]

## CONTENDING POLITICAL RESPONSES AND IDEOLOGIES

Such an economic disaster had profound effects on politics. It essentially undercut the progress toward a restoration of liberalism and in many countries undermined the coalitions needed to support democratic government. The United States was an exception. Since the Republicans were in power and persisted in deflation, the voters turned toward Franklin Delano Roosevelt, who did not campaign for radical measures, but whose New Deal still turned toward major social and economic experimentation. The Roosevelt administration profoundly altered government in the United States by enlarging the role of the federal government, which stepped in to provide emergency relief, to organize public works (the Public Works Administration and Works Progress Administration) and to prop up farm prices by instituting limits on crop planting (the Agricultural Adjustment Act). It also put young people to work in public conservation jobs, began huge new natural resource planning and hydroelectric construction (the Tennessee Valley Association), passed a national system of old-age pensions based on compulsory business and employee contributions (Social Security) and eventually gave labour unions the right to organize workers if they won a majority in factory or plant (the Wagner Act). Roosevelt's remedies were often inconsistent, and the Congress remained more conservative. Nonetheless, despite his inconsistency and initial unilateralism, Roosevelt's buoyant politics and oratory shattered the passive helplessness that seemed to afflict the previous Hoover administration. By 1936, the Democrats became the majority party, holding the support of the southern states they had had since the Civil War, and gaining for the first time the votes of urban blacks, many farmers, labour unions, small businessmen and a critical number of patrician bankers and industrialists – a combination that kept the presidency in the hands of the Democrats for twenty years and made Roosevelt the first president to win a third and then a fourth term. Other coalitions, in Sweden or later the so-called Popular Front in France, pursued similar policies. But Roosevelt became a symbol par excellence of a popular and democratic response first to economic hardship and then to the rise of Fascism and Nazism.[10]

The stakes seemed very high. For in fact, the dominant trend did not seem to be that of the left, but the illiberal right. The appeal of fascism emerged out of the First World War, or even before. Nationalists stressed that military conflict was a fundamental condition of modern society; countries were locked in perpetual rivalry; politicians talked and talked, but soldiers solved problems. The notion of military saviours was not far away in the 1920s, and hard-pressed monarchs might appoint military dictators. Faced with growing civil strife between left and right and a move toward republicanism, the Spanish monarch appointed a military strongman, Primo De Rivera, in 1923, who governed for eight years by a sort of implicit social bargaining before being discredited by corruption, the continuing war in Spanish Morocco, and encroaching economic stagnation. Until his popularity ebbed, Primo was one of the first military saviours of the inter-war although they had appeared frequently in nineteenth-century Spain and Latin America. However, it was in Italy, Germany, and Austria where the most spectacular transformations occurred.

Mussolini organized his Fascio di Combattimento in 1919, on the basis of soldiers' camaraderie and their yearning for radicalism. The movement prospered in the Po Valley between 1920 and 1922, as it teamed up with landlords to smash the newly militant rural labour unions. As the parliament became paralysed between old and new parties, the King named Mussolini prime minister in late October 1922 (Plate 24). For two years, he ran an administration that hovered between dictatorship and a sort of manipulated party clientelism. By 1925–1926, however, he had opted for single-party rule and was transforming the ideology of fascism into a glorification of the all-powerful state and party, which must organize unions and businesses into government-sponsored 'corporations'. The opposition was driven into exile, sometimes imprisoned, or sentenced to a sort of village confinement in remote areas. A secret police, political tribunal, press censorship, glorification of the party, subjection of parliament, and claims to educate a new Fascist man made the Italian experiment a qualitatively new sort of

regime – one the Fascists themselves liked to call 'totalitarian'.[11]

By totalitarian, Mussolini meant originally that Fascism claimed the totality of political power – no other party was to exist, although in fact the other parties continued a harassed and minority existence until they were pressured to dissolve in the mid-1920s. As the regime stabilized and the term was also later applied by many European and American scholars to Hitler's Third Reich and Stalin's Soviet Union, it became even more encompassing, and suggested that the single party and the leader it glorified organized not just politics but society as a whole. The ruling party was intended to reshape the economy, education, and sports, to control the media, theatre and culture – in brief, not just suppress outright opposition and democratic institutions, but organize an all-controlling regime and society in which individuals found fulfilment through a regimented public sphere. It was this claim that was the real novelty of the inter-war period, and perhaps of twentieth-century politics in general. It was a fundamental rejection of the belief in the individual as the basis for government; henceforth it was to be the nation or the racial community, or the proletariat (and its agent the party). Liberalism was allegedly weak, talky, outmoded. The economic crisis supposedly confirmed that it had failed.

Mussolini's regime was hardly totalitarian at all in comparison to Hitler's, who required only a year to consolidate the dictatorial control that Mussolini had needed five years to build. The stability of the German Republic (known as the Weimar Republic) founded after the defeat in the First World War remained hostage to prosperity. The new regime was widely, if unfairly, blamed for the terms of the Treaty of Versailles, and it also seemed totally dependent on the deals among the political parties. When adverse economic conditions made it impossible for the Social Democratic Party that represented much of the organized working class to find a common ground with the representatives of the industrial community, the parliament was paralysed, and Reichspresident Paul von Hindenburg had to resort to rule by decree. Voters defected to Hitler's National Socialist Party, which had seemed doomed to extinction in the mid-1920s but secured 20 per cent of the vote in the September 1930 Reichstag elections. Continuing parliamentary paralysis made the party increasingly popular, and by the summer of 1932 it collected almost 40 per cent of the electorate. After growing violence in the streets and some unsuccessful efforts to find a chancellor who could alleviate unemployment and win back votes, Hindenburg was prevailed on by short-sighted conservatives and civil servants to call on Hitler as the head of a coalition cabinet on 30 January 1933. Within two months Hitler had built the first concentration camps (Plate 25), exploited the arson of the Reichstag building (probably an independent action) to arrest the Communist Party deputies and limit freedom of the press, allowed his Storm Troopers to boycott Jewish shops, introduced legislation to 'restore' the civil service – i.e. to fire Jews from government office including the educational system (Plate 26) – and finally to browbeat the Reichstag deputies to pass a constitutional amendment, the so-called Enabling Act, that gave him virtually absolute power for five years. Within a year, he would abolish the state legislatures, abolish all parties but the National Socialists, pull Germany out of the long drawn-out disarmament conference in Geneva, and win a resounding

plebiscitary approval for his policies. When President Hindenburg died at the end of August 1934, the army allowed Hitler to accumulate the power of chancellor and president as the self-proclaimed Führer.

The Italian Fascist regime and the German National Socialists shared much in common, but also had significant differences. Both movements stressed the role of the party in running the state. Both leaders had been spiritually reborn by war; Mussolini had broken with the Socialist Party in which he had made his pre-1915 career as a radical editor to take up the notion of the war as revolution and then to organize would-be radical soldiers into a *fascio*, or militant movement whose name suggested the unity of determined individuals bound together. Hitler had realized that war would give him his vocation. A young Austrian who saw his aspirations to be a great artist frustrated, Hitler was fulfilled, indeed exalted, by his military service in the German army. When he was gassed near the end of the war and then internalized the humiliating defeat, he understood that he must now live for politics directed against the flabby civilian governments and the socialists and Jews that had allegedly betrayed the country. Here was a key difference from his Italian counterpart. Nazism had anti-Semitism at its core even if over the next years Hitler might also scorn alternative parties, castigate the feckless republic, its parliamentary system and the craven compromises on reparations. Both leaders remained convinced that nations could remain vital only by virtue of war, that they were locked into a Darwinian struggle for survival, that politics must ultimately be based on unremitting conflict (a notion that tempted many theorists in the inter-war period), and that as leaders they had the personal mission to inspire and organize the masses. Mussolini, however, found his allies among the nationalist intelligentsia that emphasized the role of law, not liberal law, but the state. He retained his title as 'head of government', that is, an appointee of the monarch, and he restored the prerogatives of the Catholic Church. Hitler stressed (and found the allies to agree) that the German People, were more fluid and more encompassing than the state and its officers and that they spoke through him, so that ultimately the Führer was the source of law.[12]

## SOVIET POLICIES AND POPULIST MOBILIZATION OUTSIDE EUROPE

It is little wonder that many Western intellectuals – horrified by watching a cultivated Western nation wilfully turn its back on human rights, do away with a liberal republic, and turn toward savage values – felt that liberal democracy was impotent, politically as well as economically. Some political activists and intellectuals believed that only communism could solve the crisis of liberalism and stand up to fascism by nationalizing economic resources and embarking on a thoroughgoing state planning. While many on the left remained within the parties of democratic socialism – from whom the communists had split after Lenin came to power in Russia and whom the communists denounced in the late 1920s and early 1930s as 'objectively' helping the fascists – others believed that only the hard discipline of the Communist Party could bring about transformation. The politics of toughness and sometimes secrecy was allegedly necessary on the left, if it was not to prevail from the right. The Communist Party had

consolidated power in Russia by progressively stifling other parties and then independent voices. Even under Lenin, the party had moved to exert total control; but the system became far more repressive by the 1930s.

Stalin managed to emerge at the top of the party by adroit alliances, first by taking sides against the Bolsheviks he denounced as too radical and impatient, then by turning against the earlier allies that he now claimed were too gradualist and complacent, even condemning Leon Trotsky – the outstanding leader along with Lenin of the revolutionary period – as a traitor to the Bolshevik project because he did not accept the idea of subordinating the project of international revolution to constructing a socialist order 'in one country'. In the mid-1920s, Stalin had warned against over-ambitious nationalization of village lands; now in 1928, he decreed moving beyond the NEP (the New Economic Policy was a retreat from war communism that allowed the resumption of small private enterprise, foreign investment and the retention of private peasant lands) and forcing the peasants into collective farms. Peasants resisted but, over the course of a year and a half, local communists applied pressure so that they would faithfully troop to the local authorities and place their land either in the nationalized plot (the Sovkhoz or state farms) or the local cooperatives (Kolkhoz, or collective farms). Their animals were also taken, as were tractors and other implements. To orchestrate this vast renunciation of individual holdings the party started a campaign against allegedly wealthier peasants, the Kulaks, who could employ farm labourers and were supposedly dedicated to bitter counter-revolutionary resistance. The rallying calls of the hour became 'dekulakization', 'the Kulak as the bitter adversary and rapacious rural creditor'. Above all in the Ukraine, where resistance to the Moscow regime remained strong, the party moved into high gear, cutting off supplies and contributing to widespread famine. Bukharin would incur Stalin's later revenge by suggesting that peasants would produce more in response to market incentives, but the party leadership would then have remained subject to the resistance of this huge social group.[13]

No sooner was the collectivization campaign underway than Stalin introduced the first of several Five Year Plans; an ambitious and rapid effort to increase industrialization. The NEP vanished in the cities; property was taken over, vast numbers of rural workers were forced off their land and into the cities, where they laboured intensively to build factories, the Moscow subways, hydroelectric plants, the iron and steel industry of the Don Basin, new Siberian centres of industry. Gigantic projects became the order of the day. Much of this, too, was inefficient, and a great deal rested on semi-coerced labour especially of the youth organization or Komsomol.[14] But at a time when Western economic output was falling sharply, and the misery of unemployment raged, the Soviet Union underwent an industrial transformation of unprecedented rapidity. Communists and left-wing intellectuals in the West could boast that while capitalism was finished, Soviet communism was transforming Russia, unemployment was unknown and the economy was leaping ahead.

Any real achievements, however, came at the cost of political freedom. The party embodied the wisdom of history, and it, in turn, depended upon the wisdom of the leader, its First Secretary, Comrade Stalin, increasingly the recipient of adulation, who guided a worldwide movement,

resisted fascism and redefined political theory and culture. And into this world of total control – so appealing to many Western intellectuals, so devoted to history and higher purpose, and potentially the only force to stop Nazism – came a fantastic series of political upheavals in which, orchestrated by Stalin, the party turned on its own vast membership, discovered and denounced plot after alleged plot, and through a series of show trials, first of alleged plotters against the Leningrad Party, then supposed wreckers from the factional fights of the 1920s (Bukharin and Trotsky), and finally against half the army command (accused of being in league with the Germans abroad). No one knows how many party members were expelled, arrested and ultimately shot. Millions were sent to the forced labour camps, the gulags, where the toll taken by cold and disease remained very high.

Faced with this phenomenon, Western interpreters took the concept that the Italians had themselves coined – totalitarianism – and applied it to those aspects of the dictatorial experience of the 1930s that Fascism, National Socialism and Stalinist Communism had in common: the role of the party, glorification of the leader, the use of terror and arbitrary arrest to destroy solidarities and 'atomize' the population, and planning for war. Like all typologies, 'totalitarianism' subordinated specific differences among the experiences to which it was applied: the extermination of the European Jews found no parallel in the Soviet Union, nor did the latter regime ever indulge in the plans for widespread conquest that motivated Hitler. Later historians, perhaps reacting against the Cold War era idea of totalitarianism – made famous in Hannah Arendt's volume *The Origins of Totalitarianism* – would suggest that totalitarianism was less total than originally depicted, that interstices of private life, inner opposition and culture might exist, that rule was fragmented and often inefficient. These observations are correct, probably more correct for Germany than Russia, and most correct for Italy. Nonetheless, the totalitarian experience of the 1930s was one of the defining moments of the twentieth century – a moral extreme that (along perhaps with the later Cultural Revolution in China) seemed a nightmarish culmination of history.

Outside Europe, the Fascist and Soviet experiences found admirers who thought they could borrow selected elements from the new European movements. Chinese politics remained in disarray, eight years after the declaration of a republic and displacement of the Manchu Dynasty in 1911. Revolutionary authority quickly passed from the ideological leader of the revolution, Sun Yat-sen, to General Yuan Shikai, who manipulated the last vestiges of imperial authority in Beijing, as well as claiming the mandate of the new revolutionary parliament; but Yuan died in 1916. When outraged students in Beijing marched against the feebleness of their regime on 4 May 1919, the country they sought to mobilize was fragmenting under their feet. The north of China soon disintegrated into competing warlord jurisdictions, while Japanese forces retained footholds in the former German colonies in Shandong as well as railroad centres of Manchuria, and even for a while in the coastal region of a disintegrating Russia. Back in China and based in Canton (Guangzhou) in the south, Sun Yat-sen turned to Soviet advisers and reorganized the Guomindang (Chinese Nationalist Party, KMT) along lines deeply influenced by Soviet party practice. But the KMT included diverse factions and interests. After Sun's death, his successor, the organizer

of the new Whampoa military academy, Chiang Kai-shek, initially continued the communist collaboration and reaffirmed Sun's venerable 'Three People's Principles' that stressed nationalism, democracy and socialism. Between 1925 and 1928, Chiang Kai-shek came the closest he would ever be to transforming the KMT into a national revolutionary force, winning control in the south and central coastal China, establishing his capital at Nanjing, and finally turning on his own unprepared communist collaborators (Plate 27). By 1928, the KMT ejected the Beijing warlords and completed their takeover. The remnants of the erstwhile Chinese Communist Party (CCP), who had, as Stalin consistently urged, collaborated with Chiang until the end, remained in disarray, until finally in the mid-1930s, they migrated to a new regional stronghold in Yenan and reoriented their strategy around Mao Zedong's concept of peasant revolution.[15]

Nationalist and populist political mobilization was thus a far broader experience in the 1930s than just its German or Italian manifestation might suggest. Not all of it was totalitarian; even in Japan the encroachment on civil liberties and dissenters depended less on a well-formed ideology of state or party power than intimidation by zealots and the slow stifling of opposition. Nationalist strongmen embarked on heroic modernization as in Turkey. Populists, often from the military, attacked the entrenched elites of wealth and privilege in the name of the people in Latin America. Lazaro Cardenas, president of Mexico, restored the lustre of the institutionalized revolution and its party (the PRI) by listening to country folk at the grass roots and then nationalizing the British and American oil companies. In Brazil, where the federal states retained a good deal of authority, the state governor Getulio Vargas seized power in 1930, as the precarious power sharing of state magnates broke down under the impact of the disastrous fall in coffee prices. By 1938, supported by Brazilian fascist 'Integralistas', Vargas dissolved the congress and declared a 'New State', a title that the Portuguese military leader Salazar had shortly before invented to describe his own authoritarian coup. Vargas's new constitution, while never fully implemented, nonetheless entrusted him with total power as President of the Republic.

In Argentina, the developing middle classes managed to secure a decade of liberal (radical) rule through the 1920s, only to have the earlier oligarchic elements – generals, ranchers, bankers and clergy – seize power in 1930. The military took over in 1943, and the most talented of their number, Juan Peron, built a new populist movement in symbiosis with the labour unions of Buenos Aires.[16] These populist leaders mobilized working classes and the poor (the *descamisados*, or shirtless ones, in Argentina), threatening liberal newspapers and the parliaments and parties traditionally controlled by entrenched and privileged elites. The Latin Americans sometimes claimed to emulate the Fascists, and they sought to distance themselves from the United States. Indeed, a similar movement led by Governor Huey Long emerged in Louisiana in the 1930s, only to be cut short by his assassination. Wherever they arose, such movements testified to the discrepancy between parliamentary forms, which remained under the control of wealthy and powerful elites, and the reality of vast social and economic deprivation. Authoritarianism allegedly on behalf of the people thus remained (and remains) a recurrent political temptation for ambitious and demagogic leaders.

## ORIGINS OF ANOTHER WORLD WAR

By the late 1930s, therefore, all the bright hopes of the League of Nations, of internationalism, of tolerance and liberalism, were sputtering to an end. Only a decade and a half separated the last military echoes of the First World War in the eastern Mediterranean (1922) from the Marco Polo Bridge clash between Japan and China (1937), which opened the East-Asian theatre of the Second World War. An even briefer six years separated the treaties of Locarno (1925), which seemed to ensure peace in Europe, from the Manchurian takeover by Japan that defied the principles of the League of Nations (1931). This period (shorter than the wars in the ex-Yugoslavia) marked the brief moment, in which it appeared that 'collective security', as embodied in the League of Nations, might be feasible.

Collective security in the inter-war years did not have the same connotation as the concept later adopted from 1949 to 1989, when it referred to the NATO alliance against and the Warsaw Pact and a perceived Soviet threat. Inter-war collective security meant that all nations in the League should come together if one of their number or a country outside demonstrated aggressive behaviour. It was more fluid and ad-hoc, yet this beautiful dream also proved hard to put into practice. By the 1930s, it was clear that some countries, pre-eminently Japan, Italy, and eventually, Nazi Germany, had expansionist designs. The first breach of collective security took place in Asia, where the Japanese military, still aspiring to a hegemonic role in northern China, became alarmed by Chiang Kai-Shek's advance toward Beijing. Japanese units had established their 'dominant' power in Manchuria by 1910, and they remained involved in warlord politics after 1911, and during the 1920s. As renewed claimants to power in Beijing and North China challenged Chiang Kai-Shek's claims to authority, the Japanese occupiers across the wall continually intervened, finally seizing the excuse of intervening to prevent local clashes that threatened the railroads to seize control of the Manchurian provinces in 1931 and then to reorganize the vast industrialized areas into a Japanese protectorate, named Manchukuo. The Chinese Government had little choice but to accept the *fait accompli*, and while the League sent a mission to investigate and deplored the action, it took no concrete counter-measures. Japan responded to the sanction by simply withdrawing from the international organization.

The intervention had decisive influence within Tokyo as well. The Japanese Government was divided between liberal and nationalist leaders. While the liberals included cautious military officers and admirals, and there were civilians among the nationalists, increasingly it was the military establishment that formed the backbone of the nationalists. The death of the Taisho Emperor (1912–26) and elevation of the young Hirohito (known by his official name as the Showa emperor, 1926–89) marked a difficult period for Japanese liberalism (Plate 28). The second half of the decade saw a series of rival party cabinets and leaders, who were unable to effectively organize the new potential for mass democracy, which seemed primarily to generate corruption and inside deals. The collapse of rice and silk prices (perhaps two-fifths of peasant families grew cocoons) during the Depression was disastrous for the rural economy. Rural impoverishment and the rise of prostitution as a recourse for hard-pressed peasant families, many of whom also had

menfolk in the military, meant a reaction to the liberalism and democratization of the previous decade and a call for patriotic virtues. The Manchurian adventure gave the rising militarists at home a stronghold outside the jurisdiction of Tokyo, and there was always the danger of a coup at the periphery should civilians try to limit the army's role. Tension increased and right-wing officers felt justified in taking up the weapon of assassination, following the example of young Samurai officers in the turbulent transition of the 1850s and 1860s, and by the fanatic who attacked Hara in 1921. In attempted coups of May 1932 and February 1936, the prime ministers were assassinated.[17]

The programme of expansion was renewed in 1937, as Japanese troops exploited a clash with Chinese soldiers at the Marco Polo Bridge near the border of Manchuria to launch a rapid invasion southward. Japanese forces moved swiftly, but were only partially successful. They rapidly took the coastal strip of China, indulged in a brutal occupation, and when they arrived at Chiang Kai-Shek's southern capital of Nanjing carried out an orgy of brutal killing of Chinese prisoners and civilians – perhaps up to 300,000, while the delegates of Western powers, who as a legacy of their own special status, observed from their extra-territorial enclave. However, Chiang Kai-Shek's government retreated into the interior with a capital at Chunking and some provisioning via the 'Burma' road into British held territory. A stalemate prevailed, and the Japanese had to contemplate a more extensive war than originally conceived.

Such a war would probably entail a collision with the West. To justify expansion, the Japanese leaders recommended uniting Asians against colonialism in a Greater East Asia in a co-prosperity sphere, although the blessings of liberation they were bringing to the Chinese invalidated the concept. It was clear that the United States, with bases in the Philippines for at least another decade, sympathized with China and would resist accepting Japanese hegemony in the western Pacific. With its colonies of Hong Kong and Singapore and its role in Burma (Myanmar) and India, Great Britain was also a potential foe even if London feared a war in Asia at a time when the German menace was growing in Europe. Another possible enemy was the Soviet Union, with its long Manchurian frontier, as well as memories of Japanese occupation of its far eastern territories during the Russian civil war, and the war they had fought over Korea during 1904–05.

Faced with Chinese resistance and the hostility of the Western powers, the Japanese had to make difficult choices. At this point, international rivalries became crucially important. For the Japanese army, a collision with the Russians seemed the greater danger or the greater opportunity. Did it not make sense to take advantage of the apparent turmoil that the vast purges suggested might be underway in the Soviet Union to strike pre-emptively? Japanese probing actions against the Soviet and Mongolian border region, however, were badly pummelled in 1939 by the Russians at the large clash at Nomonhan, which suggested a large attack would not be easy. Moreover, the German-Soviet non-aggression pact of August 1939 meant that the Japanese could not count on the Soviet's having to fight a two-front war. After Hitler's attack on Russia on 22 June 1941, that situation drastically changed, but by that time the Tokyo government was also reorienting its objectives. The Tokyo government secured its own neutrality pact with Moscow in April 1941, and advocates of continued

expansion to the south urged their case. The Imperial Navy especially looked to a wider war in the south; Japan lacked the oil for its expanded fleet. It was imported from the United States and the Dutch East Indies, but if these sources were cut off, then conquest of the Indies might be the only recourse. Such a manoeuvre would involve war with the British, the Dutch and probably with the Americans as well. As of 1938–39, these alternatives were unresolved and indeed still somewhat theoretical. Americans were still far from involvement, committed largely to neutrality, enraged by the atrocities in China, but with a relative handful of primitively armed troops in the Philippines or Hawaii hardly prepared to constitute a serious threat. But the time for decision was approaching. The German-Soviet non-aggression pact, the subsequent outbreak of war in Europe and the adverse fortunes of the Allies – with the conquest of the Netherlands and France, and the siege of Britain – American rearmament and fleet expansion and its control of steel and oil supplies, were soon to make Japanese choices all the more acute. The one option that might have spared Japan an expansion of conflict – a retreat from China and return to the regional pacts of the 1920s – was, however, precisely the choice that military control of policy-making precluded.

Manchuria and the visible ineffectiveness of the League would have important ramifications in Europe. Collective security was a weak reed. Hitler decided that he would not be bound by its constraints. In *Mein Kampf*, the book he dictated during his brief imprisonment after the unsuccessful Munich coup of November 1923, Hitler had outlined a vision of a vast 'living space' (*Lebensraum*) in east-central Europe, where German settlers would rule a population of Slavic peasant subjects. Only a few non-Germans believed that a German Chancellor would actually cling to such a brutal and megalomaniac vision. Hitler's advent did not seem to radically escalate German ambitions, but in December 1933, he demonstratively withdrew from the long-standing disarmament parleys at Geneva on the pretence that the French would not agree to equality of arms. By March 1935, he announced that Germany no longer considered itself bound by the military clauses of the Treaty of Versailles; the country would activate a conscript army (to fill out the cadres that had already been planned) and build a military air force.

How should the West react? The underlying dilemmas of the new order resulting from the Versailles Treaty, based as it was on keeping Germany safely disarmed, emerged with painful clarity from 1934 to 1936. To go to war over an announcement of restored German military sovereignty seemed excessive. The European left still believed in disarmament, the new generation of youth seemed deeply pacifist, still disillusioned by what seemed the pointless sacrifice of those now in their thirties and forties. If France would not disarm, why should Germany not be allowed to restore its own forces? France, Italy, and Britain convened at Stresa to declare that they would cooperate to resist any German aggression, but their response amounted to little. For a few years after 1935, the French and British would still retain a preponderance of force. Hitler had vast ambitions, but he was not mad; he understood what was feasible and what was not. If there had been a firm Anglo-French policy of deterrence, it might have restrained his behaviour or – so Germans secretly reported over the next years – led the generals to remove their Führer rather than

be forced prematurely into a disastrous war. But in fact, neither London nor Paris was willing to sustain a policy of firmness.

The precariousness of the Versailles Treaty became even more apparent, therefore, when Hitler announced in March 1936 that he would no longer observe the strictures against garrisoning the demilitarized zone that extended from 50 km (30 miles) east of the Rhine to the French border (Plate 29). Hitler assured his nervous generals that Paris and London would not act, and he was right. The British opponents of resistance argued that the territory, after all, was German, and French policy-makers, desperate to avoid war, were happy to defer to London. Each appeaser drew support from the other.[18]

Diplomacy and possible deterrence of Hitler became additionally hostage to paralysing conflicts between ideological systems. On 6 February 1934, right-wing squads and pro-fascists marched on the French Parliamentary Palace across from the Place de la Concorde and had to be dispersed by gunfire. Their mobilization was followed the next day by a massive demonstration of the left-wing supporters. Just six days later, the Austrian Christian Social Party – increasingly authoritarian in orientation and seeking to hold its own against the competition of a pro-fascist Fatherland Front – forcibly suppressed the Social Democrats, shelling the apartment complexes that housed the Viennese working class and imposing a quasi-dictatorial regime.

The new Spanish Republic, voted into power in 1931 with high hopes, was also torn between left and right. After a Republican victory in municipal elections, Alfonso XIII, discredited by his long reliance on the military dictator, Primo de Rivera, departed into exile. The left-wing coalition – including the Republicans, led by the newly chosen president, Manuel Azana, the socialists, and the delegates from the Catalan and Basque regions in quest of decentralization – introduced a new constitution providing for autonomy statutes for the Catalans and the Basques, and a secularized school system, which aroused the hostility of the Catholic Church. However, the coalition was unable to agree on a land reform programme. Agrarian radicalism, organized by the powerful anarcho-syndicalist trade unions (CNT), which refused political cooperation, continued to seethe. Facing mounting problems, and dissolving from within, the left-wing coalition was voted out of power in 1934. The new centre-conservative government delayed the reforms in progress and tried to undercut the concessions to the autonomous regions, helping to provoke what proved a very ill-advised revolt by the populist leader of the socialists, the northern mine workers, and Basques and Catalans who feared they would lose their newly promised autonomy. The government flew in troops from Spanish Morocco, suppressed the revolts, arrested thousands and seemed prepared to execute harsh reprisals – a policy that in turn galvanized a new left-wing re-emergence around the issue of amnesty and organized to halt what they depicted as a slide toward fascism. This new left-wing coalition – the so-called Popular Front – emerging in both Spain and France with Stalin's blessing from afar, now included, alongside socialists and the liberal left, the communists. The Popular Front thus responded to fears of fascist advance at home and (as discussed below) to the Soviets' calibration of the Nazi threat of war.

The ideological confrontation taking place in Spain was also helping to transform European international politics,

as were issues of imperialist politics. During 1934 and early 1935, Mussolini in fact still appeared to offer London and Paris a potential ally against Germany, especially since he originally feared Nazi designs on neighbouring Austria. But this divergence of the dictators was not to last. Mussolini coveted empire, and by autumn he was exploiting a border conflict between the Italian colony of Eritrea and the Ethiopian monarchy as a pretext for possible conquest. Haile Selassie, the young emperor, appealed to the League. The British and French cabinets sought to arrange a partition scheme but it aroused popular rejection at home when its details leaked out. When the Italian invasion of Ethiopia finally began, London and Paris reluctantly had to agree to the sanctions that the League voted. These remained ineffective; oil was not on the list of products prohibited to Italy, and Mussolini moved quickly with bombs and poison gas against the Ethiopians, who fought bravely but were soon subjugated. Mussolini learned that Hitler would support his aspirations, and in the autumn of 1936, the two dictators announced the Rome-Berlin Axis. In return, Mussolini accepted Germany's annexation of Austria a year and a half later.

France, Britain, and Italy might have formed a plausible counterweight to Germany until 1935. Even France and Britain alone might still have counted on their joint deterrent capacity until after the occupation of the Rhineland. Hitler had already startled his possible adversaries by removing the danger of Poland's inclusion in an anti-German alliance by signing a non-aggression pact with Warsaw in 1934. For the realistic French foreign minister, Louis Barthou (unfortunately assassinated with the King of Yugoslavia in 1934), only an alliance with Russia could effectively contain Hitler. The Soviet regime was distasteful, but so had been the Tsarist regime before 1914. Stalin, too, became preoccupied by the rise of a German regime ideologically dedicated to eradicating Bolshevism. His foreign minister, Maxim Litvinov, became the most eloquent spokesman for collective security at the League of Nations at a moment when the West was abandoning the concept.

In 1935, at the Seventh Congress of the International Communist, the Soviets announced an important change of policy: henceforth communist parties throughout the world would be encouraged to cooperate with 'progressive' elements of the bourgeoisie and the Social Democrats they had hitherto condemned as lackeys of fascism. For the elections coming up in France and Spain, a broad Popular Front coalition promised to oust the right-wing and potentially pro-fascist regimes.

Although the left as a whole did not substantially increase its vote in the two divided polities, the new coalition allowed the Popular Front to triumph in the Spanish parliamentary election of February 1936, and in the French vote in June. In both countries, the political situation seemed particularly tense and violence could easily erupt. The rallies and strikes in France following the June elections convinced many right-wing voters that the country was on the verge of revolution.

In Spain, extremists on both sides of the political spectrum were resorting to political assassination. After increasing violence in the streets between rightist and anarchist political squads, four leading Spanish generals and their confederates in numerous Spanish cities staged uprisings on 18 July, not all of which succeeded. Burgos and northern Castilla, outside the Basque Country and the

Asturian coal region, passed to the insurgents or Nationalists. In Madrid and Barcelona, Andalusia and Aragon, Loyalists initially prevailed, although a rapid ferrying of troops from Morocco quickly secured Nationalist control of Seville and southern Andalusia. In the areas controlled by the leftists, a wave of revolution broke out after the Nationalist uprising. Throughout the summer and autumn, revolutionary committees carried out rural collectivization and wildcat takeovers of factories, but the exuberance of anarchist collectives lasted for no more than a year. The communists were zealous in suppressing their would-be rivals as Trotskyites, and together with centrist Republicans and moderate socialists took over for the long task of defending republican territory. The government's appeal for international aid was largely rebuffed, except by Mexico and the Soviet Union. Russia provided assistance and helped organize the International Brigades, a major force of sympathetic volunteers, many communists in exile from Germany and Italy, others from the United States, who were sent to augment the Republic's army and fought until late 1938. The new Popular Front French Prime Minister, Léon Blum, contemplated sending assistance, but he was unwilling to act unilaterally as the British refused to intervene arguing that they did not want the war to spread. Instead, Britain took the lead of patching together a non-intervention agreement supposedly designed to preclude all outside intervention or aid. Nonetheless, Italy and Germany were willing to supply the insurgents with air power and trained pilots. Madrid became the first city to experience sustained air bombardment, in November 1936, and German squadrons destroyed the Basque town of Guernica in the following year. The civil war lasted almost three years and cost the lives of half a million (of the 25 million) Spaniards. Over the long run, the Nationalists prevailed, slowly conquering more territory, ultimately splitting Barcelona from Madrid, and forcing hundreds of thousands over the Pyrenees in early 1939. Franco took power in the name of the Falange (itself a mixture of would-be fascists and Catholic traditionalists) and the Navarre Carlists, a far-right political party and militia (Plate 30). Spain slipped into two decades of repression and stagnation, its regime surviving the defeat of the fascist powers in 1945 because Franco kept the country out of the Second World War despite Hitler's insistence.

The Spanish Popular Front perished in civil war, while in France, the movement petered out from its own contradictions. A triumphant left-wing majority came to power in June, bringing to office a Jewish Socialist prime minister, Léon Blum, who admired Roosevelt and sought to institute a programme of wage hikes, paid vacations, and reformist measures. The right-wing opposition hated the coalition, and some of Paris's fashionable young intellectuals began to dream of Fascism and Nazi activists. The ruling coalition soon succumbed to disagreements. The moderate Radical Socialist Party of the provincial middle classes had joined the coalition to win the elections, but they hardly warmed to socialist causes, and when the communists unfurled the red flag or sang the International they had second thoughts.

As the new government took office, a massive wave of sit-down strikes shook the country. Blum summoned industrialists and union officials to sign a collective-bargaining agreement that raised wages, recognized the unions and mandated a forty-hour week and paid vacations.

The government nationalized the Banque de France and indulged in a rhetorical fusillade against 'financial feudalism'. Although Blum inherited a milder version of the European depression, joblessness was nonetheless preoccupying, and he sought a Keynesian reflationary solution involving public spending. But the government – still committed long after the British and Americans had ceased to maintain the gold value of the franc – faced capital flight. Blum finally did have to devalue; he also declared a 'pause' in his legislative programme and finally sought exchange controls to halt the export of capital. Rebuffed by the upper house of the parliament, he resigned in 1937. A new cabinet, now led by a Radical Socialist politician devoid of reformist inspiration, led the majority. Blum would return briefly in the spring of 1938 as Hitler annexed Austria. Henceforth his task was to try and rally a less partisan government for the sake of rearmament. Indeed he had nationalized the fragmented aircraft industry and his energetic aviation minister encouraged new production, but conservatives refused to cooperate until the remnants of the Popular Front were dismantled. The consequences went far beyond France, as possible projects for colonial reform in Algeria and above all Indochina were placed on hold. In the metropole, another Radical Socialist, Georges Daladier, now prepared to distance his party from their earlier cooperation with the parties and unions of the working class.

By 1938, the governing coalitions in the Western democracies had in effect long abandoned the concept of collective security and were unwilling to entertain any alternative but trying to satisfy Hitler's demands and hoping that he would be satisfied by reuniting the German peoples of Central Europe into his Reich. The French would not act without the British, and under Neville Chamberlain, the British Conservative majority was committed to settling German grievances by the policy they defined as appeasement. In March of 1938 when the leader of the Austrian Christian Socialists tried to organize a plebiscite to demonstrate that his country wanted to remain independent, Hitler marched into the neighbouring nation to great acclaim and organized a vote that showed overwhelming enthusiasm for forced integration into Greater Germany (so-called Anschluss). Hitler himself was clear that at some point war would come with the Western powers and continued his 'four year plan' of military build-up. By late spring of 1938, he turned his attention to Czechoslovakia, where the country's three million German speakers (originally from the Austrian Empire) were being stirred up by local Nazi supporters who claimed that Prague was imposing intolerable restrictions on their ethnic identity. Hitler seemed to be threatening to go to war. British emissaries and the press suggested separating the ethnic German Sudetenland from Czechoslovakia and allowing it to unite with Germany. The Czech Government headed by Eduard Benes could have forced France at least to honour treaty commitments and go to war with Germany if it had insisted on taking up arms, but fearful of being abandoned, the Czechs finally consented to the deal that Chamberlain insisted on negotiating with Hitler in late September and October 1938 at the conferences held in Bad Godesberg, Berchtesgaden, and Munich. Stalin himself sensed that Britain and France were deeply reluctant to confront Hitler as he withdrew the International Brigades from Spain and in the next year would consider his own arrangement with Germany.

Chamberlain presented the Munich Agreement as a great triumph. He had preserved the peace, and Hitler had assured him that he had no further claims in Europe. The Labour opposition and, just as important, the opponents of appeasement in his own party were less sure. In any case, Hitler – taking advantage now of Polish and Hungarian designs on those portions of Czechoslovakia inhabited by their irridenta as well as of Slovak demands for autonomy – moved into Prague in mid-March 1939. He annexed Bohemia and Moravia as a 'protectorate' within the 'Great German Reich' and allowed the Slovaks their own dependent state. Chamberlain reluctantly concluded that Hitler could not to be trusted to keep his word, and the British extended guarantees to Poland and Romania. Chamberlain's apologists claimed that appeasement had won the West a year to rearm, and indeed both Paris and London accelerated their rearmament. But Hitler was also arming further, and the resources of Czechoslovakia were now lost to any Western coalition.

The major question was the stance of the Soviet Union, and on this issue scholarly debate still continues. Stalin had clearly lost interest in Popular Front collective security by late 1938. Stalin could justifiably conclude that the French and British had no serious interest in an effective military alliance with Moscow. Deep into the summer of 1939, they showed no urgency in part because they discounted the efficacy of the Soviet military forces after the purge trials and probably in part because of ideological blinkers. By the spring of 1939, Stalin dropped his foreign minister Litvinov (who as a Jew was offensive to Berlin) and was exploring negotiations with Germany. He continued to pursue them even as, by the summer of 1939, the British and French – who consistently underestimated the Soviets' military capacity – desultorily began to approach the Russians. Hitler could offer more than the Western Allies, however: one-third of Poland and perhaps a free hand elsewhere in Eastern Europe; and on that basis the Non-Aggression (Ribbentrop-Molotov) Pact of 23 August 1939 was concluded, permitting Hitler to attack Poland a week later (Plate 31). Ostensibly the friction arose over the issue of Warsaw's ill-treatment of Germans in the Polish Corridor, but the immediate goals were the recovery of Danzig (present-day Gdansk) and the conquest of Poland. The Germans staged a border incident to justify their invasion of Poland on 1 September, and Britain and France responded with a declaration of war on 3 September.

## THE SECOND WORLD WAR

The Second World War dwarfed the First in its extent and its destructiveness. The line between civilians and soldiers, which had still been largely observed in the First World War, was virtually erased. The Nazis used the SS as well as units of the army to pursue genocidal policies in their areas of conquest, attempting to annihilate all the Jews of Europe (they managed to kill about 6 million of Europe's 11 million Jews, several hundred thousand Roma and Sinti, large numbers of homosexuals and people with disabilities, and many Russian and Polish civilians, as well as thousands of reprisal victims in the West). The air war increased in destructiveness: German bombers had been used with increasing devastation against Madrid and Guernica in the Spanish Civil War in 1936, against Warsaw in 1939, against Rotterdam in 1940, and then with great destruction against London, Coventry and other targets in the Battle of Britain in 1940. By the time the Anglo-American forces began their bombing offensive, they used hundreds of four-engined bombers on city targets and killed tens of thousands in Berlin and Hamburg and other German cities, culminating in 35,000 dead in Dresden (February 1945), and, in Japan, with perhaps 100,000 dead in the great Tokyo incendiary bombing. Approximately 150,000 lost their lives when the atomic bombs were dropped on Hiroshima and Nagasaki. Since the war effort depended on civilian production facilities, it was believed that such civilian casualties could be justified. Wartime famine conditions killed millions in China and even in British-held Bengal.

By the time the war ended, some 60 million people had perished from war-related causes. Populous urban centres were devastated, food production was curtailed, and millions of refugees displaced to wander across Europe. The Russians paid the heaviest toll and lost perhaps 25 million soldiers and civilians. The Jewish communities of east-central Europe had been liquidated. And in a final chapter about 12–15 million Germans were driven from the recovered Czech Sudeten land and the formerly German territories of East Prussia, Pomerania and Silesia (awarded to the Poles, who had lost the eastern borderlands they had disputed with the Soviet Union since the First World War). Perhaps 3 million ethnic Germans died in these 1945 upheavals, along with about 600,000 killed in air raids on German cities, 4 million soldiers and another 2.5 million who never returned from military captivity, a heavy price for their earlier enthusiastic support for Nazi policies. In Asia, up to 15 million Chinese may have died in famine and flooding and military-related operations; the Japanese sacrificed about 2 million of their soldiers and perhaps 400,000 of their civilians to bombing, against which they had no adequate defences. Perhaps a million Indians died in the wave of refugees who poured back from conquered Burma, and at least another million in the Bengal famine. Half a million Vietnamese perished in the famine of 1944. Even when famine did not kill millions outright, the misery of cold and hunger (as in the Netherlands in the winter of 1944–45, or besieged Leningrad) carried off infants and the elderly and imposed mass misery. Major cities of Germany, Japan and western Russia, along with Warsaw, Budapest, Manila and dozens of other urban centres, lay in ruins. The railroads, bridges, ports, and factories of Italy and northern France were devastated.

The war can best be understood as four interlocking conflicts. The first was the Anglo-French war to resist German hegemony in Eastern Europe, the war that was triggered by Hitler's invasion of Poland and, in effect, was a resumption of the conflict of 1914–18. This war ended with Hitler's conquests of Norway, Denmark, the Low Countries (the Netherlands, Belgium and Luxembourg) in April and May 1940, and then the capitulation and occupation of France, and the removal of all British forces from the continent a month later. This was what has been described as 'the last European war'[19]. Britain was left to carry on the anti-Hitler battle on the North African front and at sea on the North Atlantic.

The second conflict was the major ideological war of the Soviet Union (in coalition with the Americans and the British) against Hitler. This war was started when, after a period of uneasy neutrality in Eastern Europe, Hitler

reverted to his long-held hostility to Soviet Communism and to his old aspirations for *Lebensraum* and invaded Russia on 22 June 1941. In the number of troops engaged, the savagery of the fighting, the German disregard of traditional restraints on violence and killing, the heroic intensity of the Soviet armies and industrial effort, this struggle was unprecedented. The turning points were the Russian defence of besieged Leningrad for almost three years, the halting of the Germans before Moscow in December 1941, and the German defeat at the end of the six-month combat for Stalingrad (from July 1942 to February 1943). This was the war that saw the largest land battles along a front almost 2,000 miles long, and vast civilian casualties, including the large-scale Jewish liquidations. Until the Anglo-American forces invaded Italy in summer 1943 and then, with larger forces, occupied France in June 1944, almost all the fighting took place on the Eastern Front, although the United States provided increasing amounts of materiel to both Britain and Russia through its Lend Lease Programme.[20]

The third conflict was the East Asian war, starting with the Japanese invasion of China in 1931 (if not Manchuria six years earlier), but expanding in scope with the Japanese decision to invade South-East Asia – including Burma, Siam, Indochina, the Dutch East Indies, and the Philippines – in a series of lightning attacks in December 1941 and early 1942. It was the Japanese attack on the US naval base in Hawaii (Pearl Harbor) on 7 December that finally incited President Roosevelt to overcome the divisions of American public opinion and to bring the country into war. Although American positions in the Far East were overrun and lost, in the long run the economic potential of the country and its capacity to rebuild its navy as well as a vast air force meant that the Japanese wager on a rapid conquest was fruitless.

Tokyo's calculations still remain puzzling in some respects, for the balance of material resources doomed their enterprise. Japanese policy-makers decided that American demands to withdraw from China were unacceptable, and they hoped that if they conquered the oil resources they needed and established a defensive perimeter, the United States would seek a settlement.[21] Although they rapidly overran much of the region, the British and Americans continued to hold southern New Guinea and fought over the next few years to reconquer the islands of Micronesia and eventually the Philippines and island bases that enabled them to launch massive air bombardments of the Japanese home islands. Japan might well have surrendered without use of the atomic bomb in August 1945, but there was strong bureaucratic momentum to use this new weapon once it had been developed, and the Tokyo leadership tried to negotiate for a less drastic outcome. Moreover, the Americans were impatient for surrender; the American General Staff clung to its predictions that an invasion of the home islands would be necessary and would be very costly if Honshu and Tokyo had to be taken by ground forces. The

Japanese were divided about surrendering until the very end and responded to the final ultimatums with enough reservations to let the impatient Americans go ahead with their programme. By this time, area bombing by massed bomber fleets with great civilian casualties had long become a matter of course.[22]

The fourth conflict involved what might be called 'the war of succession' in the areas occupied by Germany and Japan, that is the war of resistance movements against the occupying forces and the collaborationist governments or pro-Axis elements that collaborated with them in France, Norway, Greece, Yugoslavia, Poland and the occupied portions of the Soviet Union. Similar struggles took place in Japanese-occupied South-East Asia. This fourth conflict was thus a war of partisan armies and savage reprisals, which tended to rage in 1944–45 as it became clear that the Germans and Japanese would lose the struggle underway. Essentially it was a war to decide which elements would rule once the Germans and Japanese were forced to surrender. In France and Italy the diverse political forces within the Resistance – communists, Catholics, non-communist socialists, leftist democrats, and even traditionalist and Catholic nationalists – largely cooperated. However, in Greece, Yugoslavia, and Poland, communists and non-communists divided (and most momentously, perhaps, in China) and often ended up in a civil war within the civil war that divided both resistance coalitions from the collaborators and occupation forces.

Stalin and Churchill conferred in November 1944 and informally agreed that the West would have pre-eminent control (90 per cent) in Greece, while Russia might determine events in Romania, with Poland and Yugoslavia being split 50-50. Whether on this basis or not, Churchill helped the pro-Royalist resistance forces disarm the communist guerrillas, while in most of Eastern Europe, the pro-Soviet groups were supported in their rise to power. Thus in Eastern Europe and China and Viet Nam the last stages of the Second World War merged into the opening phases of the Cold War and national anticolonial struggles.[23] Even as millions of soldiers and the populations of the occupied and combatant countries experienced immense relief at the end of the immense war, new political and military struggles emerged in the colonial world and Eastern Europe.

It was remarkable that dreams of national reprisal and vengeance, which had so poisoned democratic politics and international relations after the First World War, played no significant role after the Second World War. In that sense, the old exaggerated aspirations of nationalism and domination among the European powers and Japan had burnt themselves out. It was now the turn, however, for long-nurtured ambitions to nationhood to emerge among the colonial peoples. So, too, the victory allowed aspirations for ideologically motivated regional hegemony to manifest themselves among the largest post-war powers: the Soviet Union, China, and the United States. Struggles over empire had not yet ended.

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22.   A massive literature exists on the American decision to use the atomic bomb. So-called 'revisionists' in the 1960s and 1970s suggested that with an eye on postwar rivalry, Washington wanted to demonstrate its nuclear power to

the Soviets. A judicious review of the decision is available in M. Bundy, *Danger and Survival*, New York, 1990, and diverse articles by B. J. Bernstein, and most recent, R. B. Frank, *Downfall: The End of the Imperial Japanese Empire*, New York, 1999.

23.  Many studies exist on all the occupied countries. For an emphasis on the civil wars involved see C. Pavone, *Una guerra civile*, Turin, 1991; W. R. Roberts, *Tito, Mihailovic and the Allies, 1941/1945*, Rutgers, 1973; M. Mazower, *Inside Hitler's Greece: The Experience of Occupation 1941–44*, New Haven, CT, 1993; A. Kédros, *La résistance grèque (1940–1944)*, Paris, 1966 (very pro-left), J. Coutouvidis and J R. Nolds, *Poland 1939–1947*, Leicester, 1986; on the Far East, C. Thorne, *The Issue of War: States, Societies and the Far Eastern Conflict of 1941–1945*, London, 1985; A. W. McCoy (ed.), *Southeast Asia under Japanese Occupation*, New Haven, CT, 1980. For great power politics in the war, H. Feis, *Roosevelt, Churchill, Stalin*, Princeton, 1957.

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# 3

# THE END OF EMPIRE AND THE TRANSFORMATIONS OF THE INTERNATIONAL SYSTEM

*Charles S. Maier*

## DECOLONIZATION

The end of the Second World War completed the transformation of the imperial systems. Although nationalist political leaders, among them Charles de Gaulle and Winston Churchill, aspired to keep control of their country's empires, this was to be a vain dream, and the efforts to renew or prolong colonial domination proved costly and often bitterly divisive at home. In Africa, the French did crush one major uprising with great bloodshed in the Aurès Mountains, and they reclaimed authority in North Africa and South-East Asia. But the colonial peoples, who had seen the Japanese overrun European possessions in South-East Asia, understood that their rulers were not invincible.

In post-war struggles those who remained loyal to the colonial powers felt abandoned to the local revolutionary forces when their former rulers finally yielded independence. 'Betrayal' of those who had remained loyal to their rulers remained a poignant theme that Westerners defending their role in Asia and Africa would evoke from 1941 until the American helicopters left Saigon in 1975. The Japanese had themselves posed as liberators of the territories they occupied from colonial rule and had found collaborators in the Philippines, Burma, and within the Indian National Army. But instances of cruelty and heavy-handed rule soon provoked resistance movements. National movements, however, such as the Vietminh, who emerged to fight the Japanese, were hardly willing to acquiesce to colonial rule once again. Moreover, the United States stood in theory behind the decolonization movements, or at least did so while Franklin D. Roosevelt was alive before the development of the Cold War.[1]

Although Prime Minister Churchill was an inveterate believer in Britain's imperial role, the permanent officials in London and the new Labour Party government (elected in July 1945) believed that Britain should seek to exercise its post-war role through indirect means. The country was financially depleted by the war as many of its remaining post-war assets had to be liquidated to pay for the struggle. It had granted its colonies in the Middle East and India extensive credits in London (the so-called sterling balances,

which in theory remained as liabilities that might be withdrawn) as it drew on their resources to fight the Pacific War. Lend Lease shipments ceased with the end of the war, and a $3.75 billion line of credit for the post-war era from the United States was negotiated conditional upon London's promise to make sterling freely convertible and to dismantle the protectionist agreements negotiated between the wars with other members of the British Commonwealth. Britain had to exercise influence rather than power, and the structure of colonial rule was thus to be transformed into a more associative arrangement.[2]

Britain, however, ruled many areas of mixed ethnicity and religion that threatened to descend into intercommunal violence when granted autonomy. Rioting and mob violence in the 1930s had already provided a foretaste of possible future events. The Arab uprisings of 1936 had led London to try to limit Jewish migration at a period in which Jews were being harassed in Europe. In India, the leader of the Muslims in the Congress, Ali Jinnah, insisted on a separate state for Muslims, and although Gandhi resisted, Nehru accepted the bitter medicine. With a self-imposed deadline of 1 January 1947, a frontier was hastily drawn – but in fact members of each community lived on both sides of the line, and the days of independence brought mob mayhem and killing as Hindus and Muslims tried to flee to their respective countries.[3]

The British, caught in the intractable conflict between Zionist aspirations and Arab interests handed the future of the mandate in Palestine back to the United Nations, which after President Truman finally resolved to support the scheme, voted for a partition into two states in the fall of 1947. The Jewish communal authorities accepted the plan. Arabs and Palestinians were determined to resist, and war between Palestinians and Jews on the territory of the mandate began and climaxed with the initial victory of the Jewish armies over the Palestinians between March and May 1948. When in mid-May the British mandate over Palestine formally ended and the Israelis declared the independence of the Jewish State of Israel, the neighbouring Arab states invaded the new country. After coming close to military catastrophe, Israel successfully defended the territory, and following truces in late spring and summer,

expanded the originally envisaged frontiers by the 1949 armistices. The successive phases of the war proved humiliating and catastrophic for the half or more of the 1.4 million Palestinian inhabitants of the territory, who fled their homes under instructions from Arab propagandists or were expelled by Israeli forces – the reasons are contested – during the course of the fighting.[4]

At the same, Britain relinquished its formal residual hold on Egypt, Iraq, and Transjordan even while military and financial advisers helped maintain a shadow influence. London was not yet ready to quit Malaya, where it faced a dogged communist independence movement during the so-called Emergency. For another fifteen years, it would not have the resolution to divest itself of the middle African countries where white 'settler' minorities still counted on Britain to prolong their control (Kenya, Nigeria, Rhodesia). And finally, it would have to prepare to leave the countries of West Africa, the Gold Coast and Nigeria, where it also left a legacy of hostile ethnic groups – the Hausa North and the Yoruba and Ibo South – confined within borders that the dominant groups wanted to preserve.

For all the vexation of imperial divestiture, the British withdrawal still seemed easy compared to the French situation.[5] Between the wars, the French Right had envisioned the 'valorization' of the empire as a way to retain a threatened great-power status, and the Vichy regime of 1940 carried on this aspiration. On the other side, Charles de Gaulle, as leader of the Free French challengers and, by 1944–45, provisional president of the new Fourth Republic, also wanted to preserve as great an overseas French role as possible. Meeting in Brazzaville in late January 1944, he and pro-Free French officials envisaged the formation of the French Union, which the reformers planned would federate the colonies and embark on their industrial development, while the traditionalist administrators insisted it would assimilate their populations without independence and preserve the political and cultural primacy of the metropole. Félix Eboué, a socialist of West Indian origin and governor of Guadeloupe, and Henri Laurentie, who advanced a sophisticated scheme for a federal assembly in which all members of the French Union were to be represented, were the major advocates of the new ideas, which collided with the conviction of most administrators and military that France's 'civilizing mission' and goal of 'assimilation' meant firm control. Shifting politics in Paris and the resistance of military officials and some colonial administrators precluded application of the more liberal interpretations, although it is unlikely that in the long run these would have satisfied nationalists. The transition in the states of French West Africa remained perhaps the happiest exception due in part to the stature and intellect of African leaders who could merge ideals of 'negritude' with the universalist aspirations that the French republican tradition offered. But the long-term evolution of all the African states would face grave difficulties, and the responsibility of the colonial state for economic setbacks and authoritarian outcomes in the decades after independence will be long debated.[6]

In the states of Indochina, the Japanese ended the formerly residual French administration in March 1945, after the Vichy regime had collapsed at home, and encouraged supposedly independent regimes. Gaullist forces resolved to reassert sovereignty, envisaged again a French Union that would cede 'appropriate' (*propre*) internal autonomy but maintain control of external relations in the hands of Paris

and its Governor General. Roosevelt did not support this goal, but he disappeared from the scene a month later. In August and September as Japanese authority collapsed, the Vietminh took control in the North during 1945, but France reoccupied the area around Saigon. French-Vietminh negotiations began in 1946. Ho Chi Minh was willing to readmit French troops in order to oust Chinese forces that might otherwise never leave. While a Vietminh delegation went to Paris to negotiate, fierce clashes, provoked certainly in part by the local French military forces, broke out in Haiphong in November and Hanoi in December. The ensuing struggle lasted eight years.[7]

The situation in Indochina introduced the French, and later the Americans who took over the struggle, to a new type of warfare that military theorists on both sides analysed as revolutionary or guerrilla war, in which the enemy were absorbed into the local population in the presence of French soldiers, but returned to reassert control of the population when the foreigners departed.[8] Such a war – as in Greece or Yugoslavia during the German occupation – was a struggle to control the local population. In Indochina, and later in Algeria, the French officers believed that the majority of the local population did not support the liberation movement, but had to be protected. The Vietminh, later the FLN (Front de Libération Nationale) in the south, were supposedly extremist, their analysis went, and famous for their ruthless violence. Instead the French proposed to set up a government under Bao Dai that would opt for union with France, but they vastly overestimated the legitimacy it might possess. Increasingly the French Right suggested that all these movements were part of a communist conspiracy to undermine the West. Indeed Ho Chi Minh was a Marxist as well as a nationalist, and committed to a communist victory. The arrival of the Chinese communists at the Viet Nam border in 1949 reinforced this sense of a life and death struggle against international communism. However, the trouble was that in fact the countermeasures taken drove more and more of the youth into the camp of the nationalist forces. The French in fact lost finally in a major conventional siege and battle in north-east Viet Nam when their troops were besieged at Dien Bien Phu. A new premier, Pierre Mendès-France, promised peace in forty days or vowed to send in a mass of conscripts and not just smaller forces of professional soldiers, and a deal struck at Geneva in 1954 divided the country at the 17th parallel. But already both sides were preparing for the next stage. The peace provided for elections in the South; Northern Vietnamese communists were seeking to infiltrate and control the elections, and the Americans supported postponement. The scale of the fighting increased in the South until the Americans had committed half a million troops. Only in 1973 would a peace agreement be negotiated.[9]

Paris had long since extricated itself from Indochina and its other colonies. Mendès-France had acceded to Tunisian self-government and the transfer of power to the long-standing nationalist movement, the Neo Destour of Habib Bourguiba. Demands for Algerian independence were another matter, however. Neither Premier Guy Mollet, a socialist, nor other centrist forces, who held power after the next parliamentary elections, were prepared to capitulate in Algeria, which the French defined as an integral part of the French Republic and included a million French settlers, who had made the cities of the coast their home. But even as

*Map 3*  **The process of decolonization**
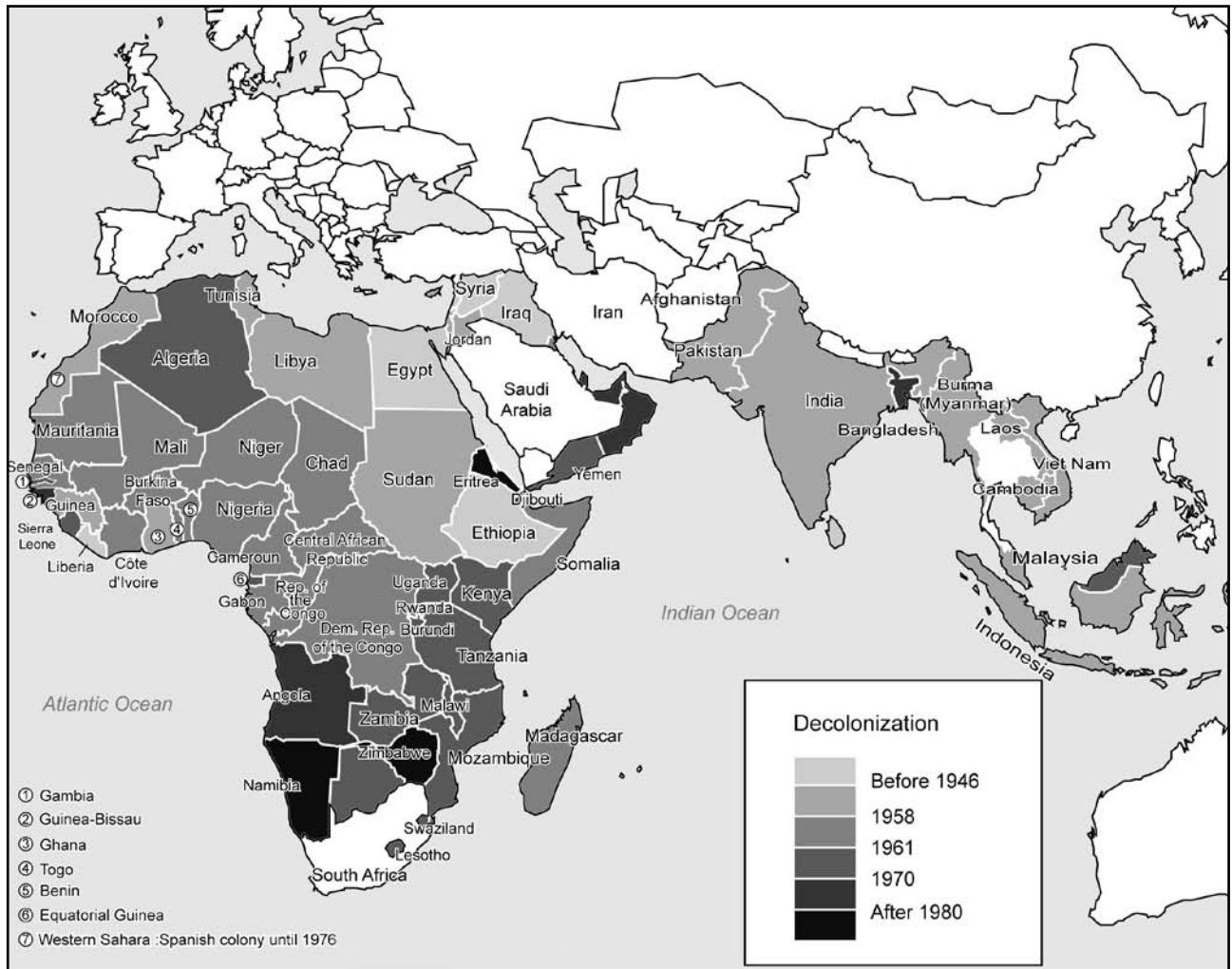


Adapted from B. Delaveau, et al., 1989, *Décolonisation et problèmes de l'Afrique indépendante*, Edicef, Paris.

the end of the war was being celebrated on 8 May 1945, in Europe and Algeria, nationalist demonstrations provoked a massive repression by the French military in Sétif and the Constantine region, which left between 15,000 and 40,000 Muslim casualties and hampered any future gradualist settlement. By the early 1950s the Resident General was determined to meet uprisings with forceful counter-measures including the destruction of villages harbouring rebels. As in Indochina, the French were convinced that the National Liberation Front (FLN, a term that would be used in Algeria and then by the insurgents in South Viet Nam after 1954) was unrepresentative of the native population they considered loyal. The FLN began to strike with bombs at European gathering places in the city of Algiers, and civilians became the true hostages of the struggle. The French applied counter-terrorist doctrines, destroying the rebel cells in Algiers, regaining apparent control of the Kasbah by using torture to interrogate captured FLN soldiers. They won 'the battle of Algiers' by 1957, but could not win 'the battle of the frontiers'. Supported by the Egyptian government of Gamal Abdel Nasser and lodged across the border in Tunisian 'sanctuaries' the FLN could be pursued only by indiscriminate air strikes,

such as the bombing of the hospital at Sakiet Sidi Yousef in February 1958, which threatened in turn to trigger a UN debate, where the Americans might have felt compelled to join in a condemnation of Paris policies.[10]

Without American support, the colonial powers just could not persevere in resisting anti-colonial uprisings. When Washington believed that nationalist forces were communist agents of Moscow, they usually lent assistance but not at the cost of a possible direct military confrontation with Russia or China. As late as 1954, President Eisenhower and his chief of staff contemplated using a nuclear weapon to help the French avert defeat in Indochina. Although he accepted the Central Intelligence Agency's plans to help overthrow the communist strongman of Guatemala, Eisenhower had the good sense to decide against Paris's desperate request.

Moreover, by 1955, the emerging ex-colonial nations, sponsored by a China now seeking to distance itself from Moscow, and likewise by India and Indonesia, and including oil-rich Arab lands, gathered at Bandung to coordinate their policies as a cohesive bloc of 'non-aligned' powers. Washington did not appreciate their neutralist stance, but the State Department did not wish to seem aligned with a

retrograde policy of defending colonial positions. In the autumn of 1956, Guy Mollet, who was angered at Egyptian assistance to the FLN, and Prime Minister Anthony Eden, who was determined to reverse Nasser's recent nationalization of the Suez Canal, colluded with Israeli leaders to plan an invasion of the Sinai Peninsula, supposedly rescue the Canal from Egyptian mismanagement, and overthrow the ambitious Egyptian leader. But the American Government decided that this policy could not be allowed to stand. It disavowed its NATO allies, and at the very moment the Soviets threatened to use missiles if necessary against Britain and France, Washington decisively applied pressure, including a threat to the British pound sterling, and compelled London and Paris to back down. The Suez reversal completely undercut Eden's domestic position and caused a deep moral crisis in London, where defenders of residual British power felt humiliated and betrayed by their major ally. It also suggested to Paris that if America turned hostile, they could not prolong their struggle in Algeria even if they seemed to be winning.[11]

These difficulties caused the uneasy coalition governments in Paris to fall apart. The conservatives and Catholics would not accept yielding control of Algeria to the FLN while increasing numbers of the centre left and the socialists were unwilling to escalate the pursuit of the rebels. In an effort to retain a majority, the government sought to offer partial reforms and autonomy, which proved too grave a concession for the right wing and insufficient to satisfy the rebels. Settlers and generals, who feared Paris would capitulate in May 1958, seized power in Algiers, formed a committee of public safety, dropped paratroopers on Corsica, threatened to land in Paris and prompted even socialist deputies to accept the return to power of General de Gaulle, who had retired from public service twelve years earlier (Plate 32).

De Gaulle won massive support for a new constitution that sharply curtailed the power of the legislature to overthrow cabinets and endowed the president of the Fifth Republic with far greater authority over international affairs and legislative initiatives. As new president, however, de Gaulle quickly came to realize that France could not win the Algerian war. From the settlers' adulation, he incurred their wrath, had to face down a new attempted *coup d'état* in 1961, and subsequent assassination attempts by irreconcilable conspirators, and finally, by 1962, signed the Evian Accords that allowed the FLN to govern Algeria.

The Dutch, who had hoped to recover 'the Indies' and overthrow the Republic of Indonesia that nationalist leaders A. Sukarno and M. Hatta had declared upon the surrender of the Japanese, abandoned their ambitions slowly. At first, they relied on the British and Anglo-Indian forces in the theatre, and then re-established themselves on the eastern islands. An armistice painfully ratified by March 1947 envisaged a United States of Indonesia under the Netherlands crown, which would federate the nationalists' republic based on Java and Sumatra with an East Indonesian State to remain controlled by the Dutch. The armistice, which faced opposition in both camps, unravelled a few months later as the Dutch decided they should exploit their 100,000 soldiers stationed so far from home and embarked on a police action that reconquered much of Java. A further agreement signed in January 1948 on the USS *Renville* also failed to hold. Events moved toward a chaotic climax as Islamic and communist challenges to the Sukarno-Hatta leadership emerged within the republic,

while Dutch forces sought to organize a federal state throughout the archipelago. Sukarno gained American support by suppressing the communists. When the Dutch embarked on a second police action at the end of 1948, occupied the republic's capital and arrested the Sukarno government, the Americans lost patience and threatened to suspend Marshall Plan aid. It was easier to put pressure on Amsterdam than on Paris, and Sukarno's nationalist movement – in contrast to the Vietminh – had proved itself staunchly anti-communist at a time when the Cold War was becoming disturbing. Unable to prevail outside the major cities in any case, the embittered Dutch ceded control of all but West New Guinea, which was yielded as West Irian only in 1962.[12]

With the early 1960s, one might end the history of the overseas colonial empires. The Indians annexed the small Portuguese enclave of Goa in 1961. The Belgians precipitously abandoned the Congo Republic in the face of nationalist resistance in 1960, although not without attempting (with CIA aid) to support a secessionist movement in the province of Katanga with its important copper mines still controlled by the Union Minière. Britain had granted the Gold Coast independence as Ghana in 1957, and Nigeria followed in 1960. London's plans to federate the departing colonies, whether in the federated states of Malaysia, the West Indies, the Central Africa Federation or Southern Arabia, lasted only a few years: each dissolved into national states upon or shortly after gaining independence. Nigeria, a federated unit since 1914, underwent a long and cruel civil war, but remained a conglomerate nation. Only a few Portuguese redoubts remained in Africa, and the Portuguese army, tired of the fruitless battles in Angola and Mozambique, revolted in 1974, to end the authoritarian regime at home and terminate a senseless war.[13]

For the former colonial powers, the end of empire brought often-immense political recrimination at home, although only in France and in Portugal did the conflicts bring down a regime. Nationalist Europeans felt their sense of national mission and historical status diminished. Soldiers who had tried to win the hearts and minds of loyal collaborators felt they were being forced into betraying them. Liberal colonialists were grieved that their lofty projects for economic development and political education were now to be interrupted. In the context of the Cold War, many feared the advance of communism. Yet, the conditions were hardly catastrophic for the metropolitan societies. The money invested in colonial enterprises did better in fact than domestic investments. Advocates of decolonization understood that their own 'civil war' – that is, the Second World War – bore a major responsibility, and that control over such distant peoples could not be perpetuated. In fact, they often learned to keep influence by indirect means; agreements with the new Algerian Government allowed Sahara oil to be exploited by France; the Union Minière kept its properties in the Congo. The British continued to train the armies of the Middle East; the promising students of West Africa came to Paris, while those from South Asia went to London and Oxford. Families seeking work gravitated from the former colonies to the cities whose language they had learned and adopted, eventually, in effect, to transplant their communities, cuisines, and cultures of the so-called 'Third World' into the cities of the former colonial powers. Europe was

prospering, more consistently than in any other period of its history, and in that post-war economic growth and the ideological exertions of the Cold War, and in the new ideas of integration – through the Marshall Plan, the Coal and Steel Community, the European Community – a new sense of Europe was born. But only reluctantly and slowly would its citizens recognize that they had to integrate as their neighbours those who had once been their subjects.

As for the former colonies, they gained the independence which almost every citizen believed was the prerequisite for their society's advancement. Westerners told them that it profited not to gain national independence if their new native rulers suppressed human rights that were better guaranteed under the colonial powers. Even Washington statesmen argued that the rule of the Communist Party over the citizens of Russia was far more oppressive than governance by colonial officials. For the indigenous peoples of the Maghreb or Central Africa or Asia, such a calculation was usually beside the point. Wisely or not, intellectuals and simple tribesmen alike believed that collective self-determination was the foundation for all other rights. They moved from being subjects to citizens. The measures for local representation, which Paris or London schemes had offered from the Government of India Act in 1935 to the Algerian Loi-Cadre Deferre of 1956, always resisted that basic grant of national self-determination. On the other hand, the indigenous governments that took over after independence often succumbed to bitter internal rivalry, military dictatorship, and ethnic strife. The institution the colonial powers had trained most effectively was the military, whose leaders often emerged with the sense that they alone might speak for the national interests of their new country, or that they alone would be free from corruption and clientelism. The era of colonial rule had left arbitrary national borders that did not coincide with tribal lines, but leaders resisted any changes lest all frontiers be thrown into contention. Nigeria's vast expanse, for example, included at least three different basic cultural areas and rivalry enough to provoke a tragic civil war. Even where partition accompanied independence, as in South Asia, inter-communal violence remained high. High expectations of economic development were often frustrated as governments sought to institute prestigious building projects, implant industries that lacked a market infrastructure, and control food prices to still urban protest. The models of state socialism attracted many intellectuals in Africa and India throughout the 1960s, even as they resisted adaptation to the world market. Foreign companies still controlled mineral wealth or petroleum resources. *L'Afrique noire est mal partie* (Black Africa in Trouble) was the title of one apt study of the 1960s.[14] Politics disappointed many intellectuals. Arab leaders yearned for unity but generally could not institute pluralist governments at home. Vast and voluble India divided into cross-cutting communities of faith, class, and region, preserved government by discussion but remained ransom to vast reservoirs of poverty and village under-development. The British had re-infused its many jurisdictions with the notion that a common state could provide the possibility for letting its fragmented people preserve political identity.

Historians and political leaders debated the so-called legacy of colonialism. Was it an unmitigated evil like Conrad's *Heart of Darkness* on a huge scale, in which arbitrary power necessarily blighted any initiative taken?

Were those who led struggles for liberation all revolutionary heroes, as students in Paris or Berlin claimed in their 'tiers-mondisme' of the 1960s and 1970s, even if they then surrendered to self-aggrandisement, grandiose and impoverishing developmental schemes, and arbitrary power? Colonial rule had withheld decisive political responsibility: it had not allowed local assemblies to educate a new parliamentary class; it allowed the native best and the brightest to study philosophy in the metropole, but not to practice politics. It trained officers, intellectuals, and civil servants at best, but not party leaders. Defenders of the system had always argued that some day the colonial world would be ready for self-government, but that day was always in the future – and then one day, it was at hand. The rise and fall of overseas colonialism were one of the most important, if not the most essential, developments of world history in the century from approximately 1870 to 1970, and it is hardly an unblemished story.

## The Cold War and a divided world

Decolonization played out against the growing polarization and tension of the Cold War. The United States and Britain on the one side, the Soviet Union on the other shared the objective of defeating the Axis, but had different visions for the future, even if both sides invoked the term democracy. Critical divisions began to emerge already before the end of the Second World War. The Russians grew suspicious at the West's waiting so long to open a Second Front in north-west Europe. Americans and British grew fearful that Moscow wished primarily to impose one-party rule on the areas of Europe its armies swept into.

Still, the months of impending and accomplished victory in 1945 brought hope for a new post-war order that culminated in the founding conference of the new United Nations organization at San Francisco from April through June 1945. Arduous allied negotiations had produced a plan for a General Assembly that was to include all fifty participating countries and a Security Council to address urgent questions of war and peace and would comprise five permanent members, the USA and USSR, France, Britain, and China, each with a veto right, plus a rotating representation of other states without vetoes. Collective security was a major strand of Franklin Roosevelt's hopes for the post-war world; the emerging UN was, in effect, his monument, and the spirit it incorporated marked the work of its major agencies (including UNESCO) and the ongoing discussions that led to the Declaration of Human Rights by 1947. For all the disappointments and divisions that would follow, the idea of an international civil society based on political and social rights remained a normative summons to global hopes for peace and freedom.

But difficult post-war issues had already emerged. Faced with potential discord after military victory, Roosevelt attempted to secure the basis for post-war cooperation at the Yalta Conference in February 1945 (Plate 33); the Russians won strategic concessions in the north-eastern provinces of China (Manchuria) bordering the Soviet Union as a price for promising their entry into the Pacific War three months after the end of the European war, a commitment they met to the day (which turned out to be two days following the destruction of Hiroshima). A compromise was patched together to overcome the rival

governments that both sides had sponsored in liberated Poland. The reinstated Warsaw government would be based mostly on the Russian-sponsored Polish committee of national liberation, although one quarter of its members would be drawn from the Polish government in exile that had so antagonized Stalin by refusing to accept his frontier demands and accusing the Soviets of executing thousands of Polish officers in the Katyn forest, a charge that was indignantly denied but turned out to be accurate. The new government in Poland, as elsewhere in Eastern Europe, was to be subject to free elections. Eastern Europeans would later complain that Yalta amounted to a condominium in which Washington abandoned the liberty of their region to Moscow in return for a free hand in the West. In fact, Roosevelt and Churchill felt that they could wrest no more satisfactory a settlement given the presence of Russian soldiers up to the Elbe River.

Washington and London grew alarmed when throughout 1945 and 1946 communist elements resorted to intimidation and violence against the pro-Westerners in Romania and Poland. The agreement reached at the Potsdam Conference of July 1945, which provided for occupying Germany as a united country and drawing reparations from its industrial plan, also broke down such that inter-allied cooperation became virtually inexistent. The British and Americans feared Russian subversion of any new all-German institutions; they were frightened by the evident conformity the Russians were imposing over their own zone through a new Socialist Unity party. The Russians and Anglo-Americans also quarrelled over Iran – both sides were scheduled to leave that country, which they had jointly occupied during the war – but the Russians were supporting communist secessionists in Azerbaijan province and withdrew only after Truman threatened a major crisis. The Russians also distrusted American control of the atomic weapon. The American offer for internationalization of nuclear production (the Acheson-Lilienthal Plan) proposed US atomic disarmament but only at the end of a long process in which other countries placed their production facilities under international control. As presented to the UN by American negotiator Bernard Baruch, the plan further demanded that the Security Council veto be set aside in enforcement issues. Soviet nuclear research was well enough underway not to have to accept what Moscow considered an asymmetric US proposal. And, on the other hand, it was probably utopian to expect that American authorities would surrender what they considered the ultimate resource of their nation's post-war power.[15]

Tension grew also in East Asia. The occupation of Japan did not give rise to the same conflict between the former coalition partners since Washington had rejected the last-minute Soviet request for a zone of post-war administration. Japan's future as a non-military, but crucial, American security partner with a unique fusion of liberal parliamentary and bureaucratic politics emerged out of General MacArthur's proconsular role in helping to shape post-war institutions. After a resurgence of left-wing and labour protest in 1947, MacArthur reined in economic restructuring. Organized labour would negotiate extensive employee security provisions, but only at the firm, not the national level. A Marxist intellectual culture would remain strong, and student protests against the close ties with Washington would shake the political scene in 1960, but

this opposition in effect remained only perpetual opposition.[16]

The future of China was troubling, but neither Moscow nor Washington could shape the outcome of that massive struggle. The conflict between nationalists and communists, barely adjourned to meet the Japanese threat, was bound to resume. As the Japanese moved toward surrender, Stalin signed a treaty with Chiang's government in return for strategic and railroad concessions in Manchuria and a Chinese guarantee that Mongolia could subsist as an independent state. A strong state run by Mao Zedong (whose peasant-oriented revolutionary mission had already clashed with the disastrous Soviet wager on collaboration with Chiang in the mid 1920s) was not likely to grant the same concessions, and the Soviet leader placed first priority on establishing a clear-cut sphere of territorial security. Moscow would consistently urge restraint on Mao even as the Civil War resumed and the Communists enlarged their areas of control. Meanwhile, the United States, which had unsuccessfully urged a mediated solution in the Marshall mission of 1946, watched as Chiang's control of China disintegrated under his miscalculated efforts to seize immediate military control in Manchuria and the North, endemic corruption, and advancing hyperinflation with its destruction of a money economy. By 1948, the Communist forces moved to open battles and won a striking series of military successes in central and then southern China.

As the Nationalists fled to Taiwan, and Mao announced the establishment of the People's Republic on 1 October 1949 in Beijing's Tiananmen Square, the Truman administration seemed initially inclined to accept history's verdict and to leave 'Formosa' to its own defence. But the commitment of the Republican Right to 'free China', the intensity of Cold War politics, and the intervention of the PRC in the Korean War precluded a simple policy of disinterest. Instead the 'loss of China' became a domestic issue, and the 'old China hands' in the State Department were scapegoated by Senator Joseph McCarthy and other Republicans, even as General MacArthur called for enlarging the Korean War to China itself, using atomic weapons, if appropriate.

As for the new Chinese regime, isolation and the devastation of the country he inherited led Mao to solicit a thirty-year treaty of friendship and aid with Moscow in February 1950 even at the cost of renouncing claims to Mongolia. The Chinese secured an aid package and the help of Soviet technical advisers. The treaty could hardly be the last word, however. If a smaller Yugoslavia (albeit aided by the United States) could defy the Soviets, a huge China could not be a predictable ally. But for the next years with the Cold War at its height and an open war in Korea from June 1950 until July 1953, the latent tensions between Moscow and Beijing remained subordinate to a sense of ideological common cause.[17]

If Washington moved hesitantly toward an anticommunist stance in East Asia, it had already become deeply committed to the policy of 'containment' in Europe. While Stalin and his advisers found the Truman administration less committed to conciliation and cooperation than Roosevelt seemed to have been, the British and Americans perceived a Soviet threat to impose unchecked Communist Party control in what Moscow described as the peoples' democracies of Eastern Europe and to drive pro-Western leaders from any influence in that

region. The behaviour of each side confirmed the other's fears. At his famous speech on receiving an honorary degree at Westminster College in Fulton, Missouri, in March 1946, Churchill declared that an 'iron curtain' was descending over Europe. It became the West's metaphor for the next four decades.

The ambiguous political agendas of 1945–46 – when in France and Italy in the West, and Poland, Hungary and Czechoslovakia in Eastern Europe, communist and non-communist power sharing still seemed possible – ended by mid-1947. Communists and their affiliated trade unions were either rebuffed or decided on a resolute opposition in the West. In Central and Eastern Europe, members of agrarian and popular parties were tried, imprisoned, sometimes executed, and the significant socialist parties painfully split over the issue of collaboration in so-called peoples' fronts that their communist allies would dominate.

In Greece, outright civil war began, provoked in part by a dubious 1946 plebiscite confirming the monarchy, then encouraged, not really by Stalin, but the Yugoslav communist leader Josep Brodz Tito, whose resistance to Moscow's discipline would make him a hated heretic in Kremlin eyes by 1948 and an ally of opportunity for Washington. When in February 1947, the British told Washington they could no longer subsidize the Government of Greece's struggle against communist guerrillas, the US president enunciated the so-called Truman Doctrine, which provided for assisting countries under attack by armed subversion. However, Germany was the major issue. With lack of unity, uncertainty about reparations, and inability to agree on a monetary reform, the economy continued to languish. After a frustrating Council of Foreign Ministers session in Moscow, the US president announced that Washington was prepared to help any regime fighting armed subversive groups. In June 1947, American Secretary of State Marshall proposed that the United States would provide cooperative European regimes access to what would amount to about $13 billion worth of imports over the next four years. As important as the aid itself (over 2 per cent of American GNP and initially a sizable percentage of what Europeans could devote to reconstruction) was the incentive it provided for further Western European cooperation – and the clear line it ended up drawing against the communist regimes in the East and the communist parties in the West.[18]

With the fall of 1947, and events of 1948, Europe, at least, became effectively divided. The Russians felt that participation in the Marshall Plan required too much control and withdrew from the conference, forcing their East European governments to follow their lead (Plate 34). They summoned Communist Party leaders to Poland in September and instructed them that there would now be a period, no longer of cooperation, but of long conflict with the West. In February 1948, the local communists forced a coup in Prague, but two months later elections in Italy confirmed the defeat of the communists. Europe was moving toward division. The Western Allies finally did carry through a monetary reform in the zones of Germany under their control and summoned a constitutional convention to create a founding document. The emerging West German State was matched by an East German one in 1949.[19]

The temperature of the conflict grew dangerously high. When the Yugoslav communists rejected Russian leadership, the schism provoked a massive reaction as all the

countries now engaged in political trials against Titoists. Indeed, under the new ideological reaction, political trials became a depressingly familiar feature in all the Eastern European countries, and non-communists, or by 1950–52 loyal communists targeted as Titoists, were forced into abject confessions, imprisoned, and sometimes executed. The wave of persecutions crested in 1952, as Stalin seemed on the verge of a major persecution of alleged Jewish conspirators, including intellectuals and even his physicians, with only the Soviet leader's death in March 1953 interrupting the ominous preparations. The United States meanwhile was caught up in its own rites of political purification, known as 'McCarthyism', as espionage revelations and the climate of the Cold War allowed the demagogic senator from Wisconsin (and other exploiters of anti-communist reaction) to try to impose a climate of political conformity.[20]

Both sides rushed to arm, and the United States helped to organize the NATO alliance in the West and proposed to its allies to accept German rearmament, finally approved by 1955. The Soviets responded with the Warsaw Pact. Fearing the massive land strength of the Soviets, the Allies responded with nuclear deterrence. When the Russians exploded a nuclear device in 1949, Washington pressed ahead with a crash programme to develop hydrogen weapons.

From 1950 to 1953, military confrontation seemed imminent. Indeed Stalin accepted the proposals of Kim Il Sung to try to reunify Korea by force, as it was believed that the United States would not intervene. But in fact the Americans did enter Korea with the agreement of the United Nations' Security Council and fought a devastating war to an inconclusive armistice in 1953. Underestimating how important China considered the stakes, Washington's policy-makers and generals were shocked when the Chinese entered the war in November 1950, but US-led troops managed to stabilize the front by the next spring.[21]

In such a context, it was hardly surprising that American views of decolonization struggles changed. The United States initially encouraged decolonization, urging the British to leave India, then Palestine, pressing the Dutch to give up their rearguard action to hold Indonesia, and ultimately aligning against the British and French during the Suez conflict. Originally the United States wanted the French out of Indochina, but once communist Chinese troops reached the southern border of China, it seemed more important to prop up the French position against the Vietminh than encourage home rule. Still, when Israel, France, and Britain conspired to re-seize the Suez Canal from Nasser, after he nationalized it forcibly, President Eisenhower ostentatiously worked to compel British withdrawal. American objectives were ambiguous. In theory pro-Third World, the US Government was reluctant to accept the fact that national movements were also effective and very loyal communists.

The emerging Third World powers tried to escape falling under the patronage of the United States or the ideology of the Soviets. Their self-proclaimed non-alignment vexed John Foster Dulles, Eisenhower's secretary of state, who tended to see the Cold War as a Manichaean moral confrontation. Still, between 1953 and 1955, there were hopes for a 'thaw' in communist policies after the death of Stalin and the advent of an uneasy 'collective leadership'. The new rulers relaxed the iron grip of the secret police and

executed their colleague, Lavrenti Beria, who controlled this feared agency; they stopped the anti-Semitic purge being prepared, and relaxed the pace of forced industrialization and collectivization in the satellites. By 1956, Khrushchev denounced the crimes and errors of Stalin to the Twentieth Congress of the Soviet Communist Party, a speech that helped to undermine ideas of party infallibility throughout communist ranks. The armistice ending the Korean War was concluded in the summer of 1953, the Indochina conflict was apparently resolved a year later; in 1955, the Russians agreed to an Austrian State Treaty that ended the occupation and provided for a neutral but clearly non-communist regime. After a flurry of notes about German reunification (probably the result of rival policies within the Kremlin), each side fully accredited its respective German ally and stabilized its respective military alliance.

Was there a chance at détente? Eisenhower met Khrushchev and Bulganin, and journalists celebrated 'the spirit of Geneva'. The Soviet leader, who finally consolidated his supremacy by 1956, gave renewed signs of flexibility, but he was not independent enough or at least not inclined to dismantle the Soviet grip on the states already in the Soviet orbit. When in October 1956, reformist Hungarian communists giddily yielded to their citizens' desire to secede from the Warsaw Pact and liberalize the regime, the Soviets invaded to suppress what became a full-scale uprising. The post-Stalin 'thaw' was brought to a halt throughout the socialist world. Instead Khrushchev decided to reinforce the status of Russia's most industrialized but vulnerable protectorate, the East German regime, and opened what became a protracted crisis over the status of East and West Berlin by threatening in 1958 to give the GDR the right to control traffic to Berlin, still officially under four-power control.

The new threat over Berlin reflected what we can now see was a period of confused departures in the history of the Cold War and indeed of world politics – initiatives that were contradictory, might have led to détente, but were still too easily reversed. For the first time since the Second World War, the United States had to face a potential adverse balance of payments situation from the end of the 1950s, which it attributed to the cost of maintaining its troops abroad. Eisenhower's effort to advance personal diplomacy at a new summit conference in 1960 was marred by the Soviet Union's capture and display of a U-2 pilot who was shot down on a covert intelligence-gathering mission high over Russian air space. The American president had to finish his term in 1961 with no real agreements but a vague warning against the role of 'the military-industrial complex' in American politics. His successor, John F. Kennedy, seemed young and innovative but fully committed to continuing an even more effective Cold War struggle, which would soon lead to his supporting the disastrous invasion of American-based Cuban exiles at the Bay of Pigs in Cuba.

On his side, Khrushchev was preoccupied about Mao's ill-conceived 'Great Leap Forward', forced collectivization (and the massive famine that accompanied it), and he recalled Soviet advisors in 1960. The ensuing polemics and rift between the two great Communist powers became a long-term feature of the socialist world. Mao's unleashing of the Great Proletarian Cultural Revolution in 1966, which convulsed China for a decade and seemed to aim at destroying all political and remaining social and cultural

hierarchies, was a frightening spectacle, not only in the West but in the European communist world.

Khrushchev's direction of Soviet and world communist politics was hardly consistent, however (which his colleagues would recognize when they peacefully removed him from power in late 1964). He under-estimated the learning capacity of President Kennedy when they met at Vienna in spring 1961 (Plate 35), although he correctly gambled that NATO would accept the new status quo when he allowed the East Germans, who faced a growing desertion of productive citizens to the West across the still-open inner-Berlin frontier, to erect the Berlin Wall. And after the American debacle at the Bay of Pigs, Khrushchev was emboldened to change the overall strategic balance and place missiles in Cuba, a wager on a windfall gain that led the world to the brink of nuclear confrontation in the fall of 1962.

Both sides were given pause by the brush with catastrophe, and by mid-decade it seemed finally that détente might resume. Foreign policy in the German Federal Republic was moving from the grip of Adenauer's Christian Democratic Union to the now reformist Social Democrats, who under Willy Brandt were preparing the concepts of Ostpolitik or negotiated coexistence with the East German regime. Throughout the Soviet bloc, ideas of mild economic decentralization and market-oriented reforms were gaining favour. Social theorists suggested that both sides might 'converge' toward mixed economies and welfare states. Nonetheless, the growing momentum for reform proved too risky for the cautious Soviet bureaucracy. When, in spring 1968, Czechoslovak party reformers sought democratic reforms and, buoyed by public enthusiasm, ultimately hinted at independence from the Warsaw Pact, Khrushchev's successor, Leonid Brezhnev, decided the movement must be quashed lest it begin spreading (Plate 36). The 'Brezhnev Doctrine' justified Warsaw Pact intervention if socialism was endangered by counter-revolution. As had happened with the suppression of the Hungarian revolt twelve years earlier, the Warsaw Pact intervention and the removal of the Prague reformers disillusioned many communists who had set their hopes on the spreading momentum of liberalization. While in 1956 defections largely involved Western communists, after 1968, the intellectuals and party members throughout Eastern Europe began losing their faith.

## The end of an era

From the late 1960s to the late 1980s, the premises of world politics were transformed in a way that historians have only begun to analyse. At the level of international politics, the changes were logical enough and might well have been predicted. Secretary of State Henry Kissinger and President Nixon spectacularly reversed America's long boycott of China and established relations in 1971. Although the new rapprochement had little immediate effect on Hanoi's policy, the United States extricated itself from Viet Nam, abandoning the South to takeover by the communist North in 1975. Mao himself called a pause to the Cultural Revolution and his successors, above all Deng Xiaoping, moved cautiously but decisively toward economic policies that combined planning and market incentives. Foreign investment and Chinese entrepreneurship unleashed a

process of growth that has transformed the country in the succeeding decades. Party control was challenged by the great manifestations at Tiananmen Square in July 1989, but successfully repressed, and the party managed to keep a growing sphere of political debate and fundamental economic upheaval under its own continuous tutelage.

Britain's return of Hong Kong to Chinese sovereignty was an emblematic step in this remarkable ascent. But it also symbolized how profoundly the relationship between former world masters and subjects had been changed as the twentieth century closed. Formal colonialism ended with the Portuguese military's renunciation of the country's remaining possessions in the mid-1970s. The remaining specimen of the older variant of land-based empire ended with the collapse of the Soviet Union from 1989 to 1991. The communist system had prolonged the possibilities for empire beyond 1917, but for reasons discussed below, could not do so after the 1980s. What critics called neo-colonialism – the domination of Third World economies by the West – did not disappear, but the balance of economic power between the industrialized West and the other world regions changed fundamentally.

'Third World' critics and theorists from Latin America had elaborated a so-called dependency theory (see Chapter 1), which argued that the prosperity of the industrial countries resulted from prolonging the relative backwardness of the non-industrialized countries in order to benefit from cheap labour and under-priced commodities. Such an analysis informed the appeals for redistribution of resources and wealth proposed by the United Nations Conference for Trade and Development (UNCTAD). Opponents of such a prescription criticized instead the developing world's misconceived vast development projects, squandered resources, disincentives for agricultural production, and corruption and repression. It would be an indication of the changed terms of debate that a leading theorist of dependency theory in the 1960s would introduce successful market-oriented reforms as President of Brazil in the 1990s.

After almost thirty years of unprecedented real economic growth, Western countries underwent a difficult decade in the 1970s. The four-fold increase in the price of cheap petroleum decided by the oil-producing countries in early 1974 contributed to both inflation and deflationary pressures. Under the pressures of inflation, the long era of post-war capital-labour solidarity, forged after the Second World War to reconstruct the European economy, began to fray under the pressures of simultaneous inflation and unemployment. The United States, which from 1948 until its involvement in the Vietnam War in the late 1960s had effectively underwritten the international economy by means of the Marshall Plan, military assistance, and private investment, faced mounting resistance to the reserve-currency status of the dollar. In August 1971, President Nixon abandoned the long-term American commitment to maintaining a gold parity for the dollar and forced a re-negotiation of exchange rates, and finally renounced any commitment to purchase foreign currencies for dollars in spring 1973.[22]

Although it could not be recognized at the time, in the 1970s the world economic and territorial system was entering a new phase of development that has only accelerated in the quarter century since. Both capitalist and communist economic systems were put under strain; the growth of a whole new technological sector, information technology and the computer, coupled with the movement of traditional heavy industry to East Asia or Latin America, meant the need to remould the labour movement in the West and East. The First World or the industrialized West saw the slow attrition of its classical industrial labour movement. The Second World or the state socialist economies of the former Soviet bloc simply disintegrated, and what was once known as the Third World tended to bifurcate, with one group of economies successfully industrializing and another falling further behind world standards. Massive waves of new migrants streamed from rural areas to the vast cities of hard-pressed developing nations, and from Asia, the Caribbean, Africa, and the Middle East to Europe and North America. International financial organizations controlling capital and production in vastly separated sites across the world provided a new framework for the economy, far less tied to traditional territorial authorities than previously. National powers in Western Europe tended to devolve 'down' to the regions of the nation-state or 'up' to the European Community (later called the European Union), which significantly enhanced its authority under the striking leadership of Jacques Delors during the 1980s. The United States, which had seemed financially over-committed in Viet Nam and Europe during the Nixon and Carter administrations, enjoyed a remarkable surge of economic growth under President Reagan and his successors, in large measure because it took such a commanding lead in the new computer-based service industries as well as the popular products of a world consumer culture. In addition, the great centre of international state socialism, the Soviet Union, in effect dismantled its own institutions and dissolved the last bastion of old-style imperial control.

How did this remarkable and totally unexpected outcome occur? Once reformist economic and political initiatives seemed to spin out of Communist Party control in the late 1960s, the Soviet leader decided that he could at least assert Russian superpower parity on the basis of the country's huge military capacity, including missiles and nuclear strength. He did secure American willingness to negotiate a series of agreements with NATO members – the Strategic Arms Limitation Treaties (SALT I and II) and the Helsinki and Madrid accords that emerged from the multilateral Conference on Security and Cooperation in Europe (CSCE). The Helsinki Accords provided for the recognition of existing borders (thus protecting East Germany), but also committed the Soviets to agree to guarantees of human rights – a pledge often violated, but one that provided a new generation of critical intellectuals in Eastern Europe with a foothold for organization and protest. Even if suppressed, Charter 77 in Czechoslovakia and, to a far greater extent, the Solidarity movement of 1980 in Poland revealed the growth of dissent within the Soviet bloc. At the same time, Brezhnev's wager on preserving superpower parity on the basis of military power also faltered. The Soviet Union's army became demoralized and mired down in the effort to control Afghanistan. Despite major protests at home, NATO members resolved to match Moscow's deployment of intermediate range missiles that would have possibly subjected Europe to nuclear blackmail. The percentage of Soviet GNP needed to preserve Russia's arsenal was also far higher than the 4 per cent or so required in the West, and the Soviet civilian economy faced grave difficulties during the 1980s. After some brief efforts to grind greater

productivity out of central planning following Brezhnev's death in 1982, and by his two short-term successors, Mikhail Gorbachov (Plate 37) decided he must loosen the grip of state socialism and introduced policies of *perestroika* ('reconstruction', i.e. decentralization and market reforms) and *glasnost* (political openness or transparency). The reforms, necessary though they were, led to consequences that he could hardly predict, including the final dismantling of the communist bloc as it had been established since the end of the First World War. With the dissolution of the Soviet Union, after an abortive coup by foes of reform in 1991, in effect the last of the old land empires had come to an end, and with it, an era of political control that had marked the period from the late nineteenth century.[23]

What forces for international cohesion might now secure world order? For almost a century, from approximately 1870 to the 1960s, the age of imperialism had linked what used to be called the First and Third Worlds. Imperialism and the world economy had confronted tribal structures in western and southern Africa and the Middle East with the centres of finance and industry in Europe and North America. It had prolonged but then destroyed the remaining land-based multinational empires – three of which had disintegrated after the First World War, and the last of which had fallen apart at the end of the 1980s. If indeed there remained new transnational forces that might help the diverse peoples of the world preserve peace and prosperity and a sense of collective dignity, these forces derived less perhaps from their respective political units, than from continuing prosperity and NGOs, who served as trustees for the environment, for human rights, and mitigating disease and hunger.[24] In effect, the NGOs concerned with environment and human rights were the transnational agents that equilibrated the for-profit firms that restlessly drove the international economy forward. Perhaps such political structures as the European Union or NATO would also provide international order.

The United States remained clearly the world's greatest conventional power, but its political agenda was reduced largely to the international enhancement of market democracies, i.e. a type of liberalism that would be favourable to the continued progress of global economic forces. As the twentieth century closed, America was less an empire than a consortium of banks, media giants, a culture industry, innovative computer companies, and enterprising providers of financial services. But it became unclear whether the United States could or would exercise a stabilizing or disruptive role based on its at least temporary military primacy. The devastating assault on the World Trade Center and Pentagon on 11 September 2001 was a shock that left American politics hostage to unforeseeable and contradictory feelings of supremacy and vulnerability. Although most of its allies accepted Washington's military intervention in Afghanistan to hunt down the training grounds of the Al Qaeda 'network' that claimed responsibility for the attack, the subsequent American and British invasion of Iraq in the spring of 2003 drew dissent from some key NATO allies, France and Germany above all. The continued military involvement in turbulent Iraqi politics also divided Americans at home. The United States might conceivably persevere in an effort to take on a wider imperial role, but it was also possible that its volatile public opinion might back away from such an exercise of power, which was unlikely in any case to prevail in a world in which the desire for order

and affluence had to coexist with the claims of militant faith. Was it not possible that by the beginning of the twenty-first century the world community might learn finally to live without empire? This was a revolutionary possibility but also a disorderly one.

## NOTES

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4. By the late 1980s, critical Israeli historians abandoned the original Israeli claim that the Palestinians had fled merely under instructions from Arab authorities who wagered on a rapid reconquest. The current debate among historians revolves more around the issue of whether plans for a forced transfer motivated Yishuv (Jewish) authorities from the outset, or expulsions gained momentum village by village during the armed clashes. See E. L. Rogan and A. Schlaim (eds), *The War for Palestine: Rewriting the History of 1948*, Cambridge, 2001; B. Morris, in his contribution, 'Revisiting the Palestinian Exodus of 1948,' documents widespread if 'haphazard thinking about transfer before 1937 and the virtual consensus' thereafter, denies any 'master plan' was applied during the war (pp. 48–49), but also sees more concerted expulsion than when he wrote *The Birth of the Palestinian Refugee Problem, 1947–1949*, Cambridge, 1987. For background see also M. J. Cohen, *Retreat from the Mandate: The Making of British Policy, 1936–1945*, New York, 1978, and Cohen, *Palestine to Israel: From Mandate to Independence*, London, 1988; B. Wasserstein, *The British in Palestine: The Mandatory Government and the Arab-Jewish Conflict, 1917–1929*, 2nd ed., Oxford, 1991.

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# 4

# NATIONAL LIBERATION MOVEMENTS AND THE COLLAPSE OF COLONIALISM

*Nodari A. Simonia*

## THE HISTORY OF THE FORMATION OF NATIONAL LIBERATION MOVEMENTS

The genesis of national liberation movements is connected with the final phase of colonialism when the West entered a higher stage of development and started to export industrial capital to colonies and semi-colonies. It was accompanied by large-scale infrastructure construction, the development of modern communication facilities, the creation of new administrative-bureaucratic structures. Moreover, during this period, a larger part of the local population had access to education. The condition was ripe for the formation of new social classes, including national intellectuals, as well as the press, new political organizations, etc. In other words, there emerged at this time the minimum historical prerequisites for national awakening and gradual transformation of uncoordinated spontaneous manifestations of traditional protest and rebellion into a modern 'nation-wide' anti-colonial liberation movement.

Important international events, such as the revolutions in Russia (1905–7), Iran (1905–11), the Ottoman Empire (1908), China (1911–13) and Mexico (1911–13) gave a powerful stimulus to liberation movements. An even more profound effect on the processes of national awakening was produced by the First World War and the ensuing Russian Revolution of 1917. However, it was the Second World War that became a historical turning point in the fortunes of the peoples of colonies and semi-colonies. The myths that the power of colonialists could not be resisted and 'the white man was invincible' were completely dispelled in the crucible of that war.

In the aftermath of the war, the countries of South-East and East Asia formed the first echelon of liberated states. Between 1945 and 1949, nearly all the countries of the region proclaimed their independence. They were followed by the states of North Africa (1951–56). As a result, during the first post-war decade, out of 1.5 billion people living in the former colonial countries, about 1.2 billion gained freedom. Ghana (1957) and Guinea (1958) were in the vanguard of a new liberation movement that peaked in 1960 ('the year of Africa'), when 17 African states gained independence. Finally, from the mid-1970s on, the Portuguese Empire began to break down, and later Zimbabwe (1980), Western Sahara (1982) and Namibia (1990) liberated themselves from colonial dependence (Plate 38). With the collapse of the racist regime in the South African Republic in 1994, the political system of colonialism came to an end.

### The specific character of anti-colonial nationalism

Nationalism was the main ideological banner in the liberation struggle of the peoples of three continents. But the case in point is a particular phenomenon, entirely different from what we know about the European experience. The origins of nationalism in Europe in the epoch of absolutism was mainly endogenous, as national identity and national statehood were forming on the basis of the developing domestic market and elements of civil society that began to take shape. The genesis of nationalism in Asia, Africa and Latin America was exogenous. It originated within the framework of the 'metropolitan country-colony' system as a reaction to the unequal situation and unjust distribution of the wealth and power. For this reason, it was, for the most part, based on an anti-foreign attitude from the outset.

Although no two countries in the region are alike, if we compare the conditions under which nationalism originated on different continents, we shall see that a larger proportion of the peoples that managed to retain their traditional statehood during the epoch of colonialism (over fifteen countries) were Asian. Most of them (up to 10) managed to remain semi-colonies. A considerable percentage of the states in Asia are characterized by a high degree of ethnic homogeneity (Japan, both Koreas, Mongolia, Bangladesh), the predominance of a main national group (China, Thailand, Turkey, Iraq, Burma, Kampuchea, Laos, Singapore) or the prevalence of closely related ethnic groups naturally united into one ethnic group (Indonesia, the Philippines). At the same time, such countries as India, Pakistan, Sri Lanka, Iran, Malaysia, Nepal are ethnically diverse. Owing to all these circumstances, the progress of national-state development

*Map 4* **Decolonization since 1945**
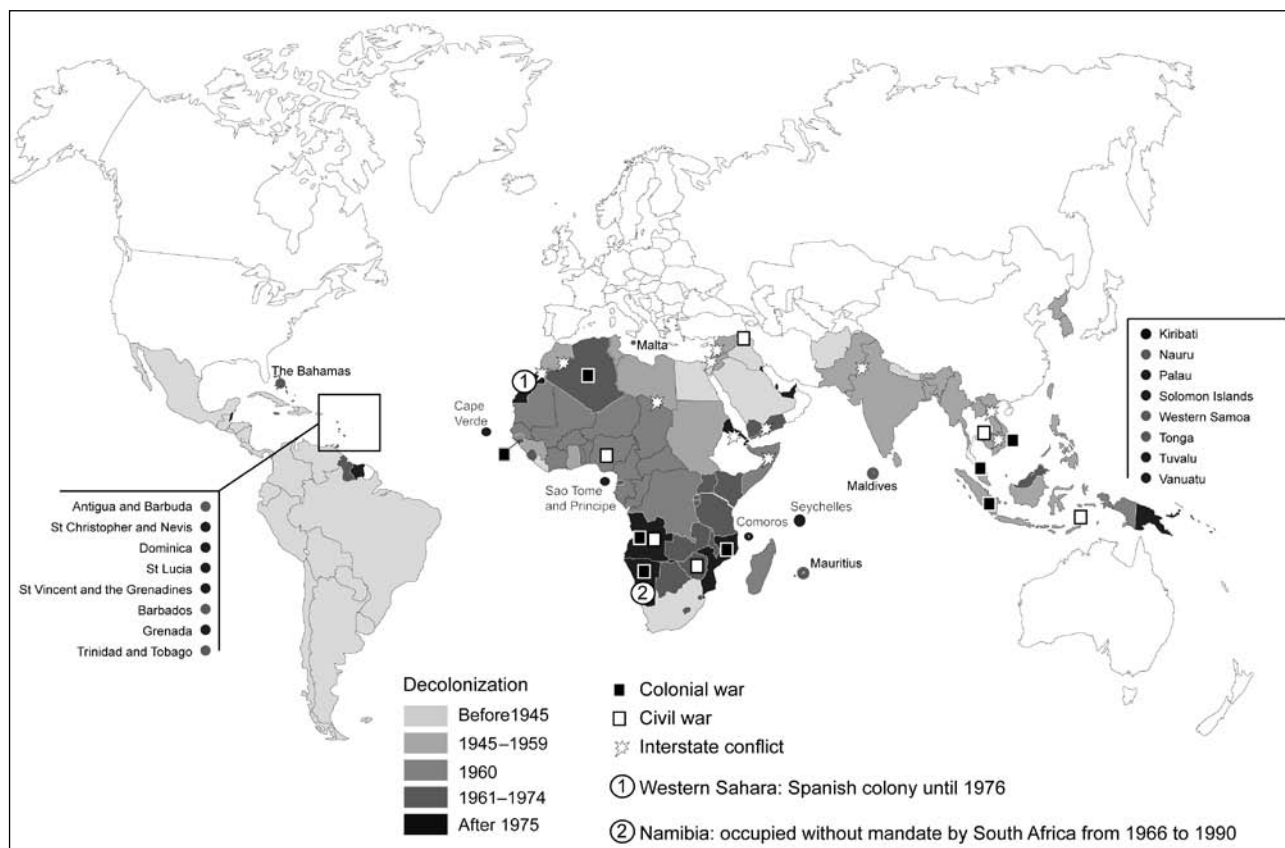


Adapted from B. Delaveau, et al., 1989, *Décolonisation et problèmes de l'Afrique indépendante*, Edicef, Paris.

in Asia is quite evident as a peculiar 'country individualism' was taking shape there, and there was no continent-wide pan-Asian movement.

A certain number of factors are responsible for the relative lateness of the awakening of a mass national consciousness in African countries. With the exception of predominantly Arab northern regions of the continent, clan and tribal relations prevailed in Africa, even where state entities were formed. On the whole, Africa was colonized relatively late. As late as 1876, up to 90 per cent of its territory was unclaimed. As a result, anti-colonial ideas originated outside Africa and were based on the awareness of racial rather than national oppression.

**Pan-Africanism**

The idea of African unity was conceived by Edward W. Blyden, from the West Indies, in the middle of the nineteenth century. He advocated unity and race consciousness of an African identity of the Negro or African race. Starting at the end of the nineteenth century, a political movement for the unification of the Negroes against racial oppression took shape. It acquired on official status in 1900 at the first Pan-African Conference, held in London under auspices of the Pan-African Association, led by Trinidadian lawyer Sylvester William. Thus, initially the movement was an initiative of the African diaspora community and was based on the ideas of cultural and

historical uniqueness and claims of the high level of spiritual development among African peoples. Its main objective was to create a single African state. In 1919, Harvard-trained sociologist W. E. B. Dubois organized the first Pan-African Congress in Paris, which was able to voice some of the concerns of Africans and to make suggestions for the educational, social and economic development of Africa and the administration of the mandated territories. The second congress, convened in London, Brussels and Paris in 1921, and the third in London and Lisbon in 1923, drew attention to the ills of the colonial system in Africa and the evils of racial discrimination resulting from the diaspora. But the fifth congress, held in Manchester in 1945, marked a turning point by the active participation of such outstanding figures from Africa as Kwame Nkrumah, Jomo Kenyatta and Peter Abraham, who were determined to shift the movement to Africa and actively pursue independence and the unity of the African continent. Beginning in the late 1950s, pan-Africanism began gradually evolving from a movement for continental unification into a movement for the united action of independent African states. The concept of African unity was interpreted in different ways by different African leaders. The various tendencies were represented at several conferences held in Africa in 1958, 1960, 1961, which resulted in the creation of the OAU (Organization of African Unity) in 1963. Ever since, all efforts (particularly in the 1980s and first half of the 1990s) to revive the ideals of pan-Africanism have been doomed to failure.

## Arab nationalism

The geographical location of the Arab world – at the junction of two continents – could not but affect the processes of national awakening. In addition, the Arabs had been conquered and remained part of the Ottoman Empire until the end of First World War. On the one hand, this factor served to consolidate the spirit of Arab unity, but on the other hand, the Arabs within the Ottoman Empire were isolated from direct Western influence for many centuries. Common historical destinies encouraged the emergence of a pan-Arab movement. In contrast to pan-Africanism, pan-Arabism was based on shared ethno-cultural, linguistic and religious factors which proponents of pan-Arabism use in their broad interpretation of the concept of a single Arab nation.

In the 1920s and the 1930s, the conditions were ripe for the emergence of 'regional' (i. e., country) nationalism, particularly in Egypt, Sudan, Syria, Lebanon, Tunisia and Algeria. Thus, pan-Arabism began to coexist alongside with 'regional' nationalisms.

Algerian nationalism was profoundly affected by the long and unrelenting liberation struggle against the French colonial power (1954–62). This struggle provoked internal radicalization and gave rise to pan-African and even 'Third World' (F. Fanon, 1925–61, French politician and psychiatrist) guidelines and orientations. In the course of struggle for liberation, Algerian intellectuals adopted a critical attitude towards a colonial-capitalist political economy and drew up guidelines for the restoration of the economy through centralized planning. Their position was formulated in 1962 by the Tripoli Programme of the National Liberation Front (NLF). After independence, nationalization was carried out and the state sector was established. The state established control over foreign capital activities. A large-scale exodus of the European population set the stage for the emergence of the system of

the people's self-government, and the first Congress of the NLF, held in 1964, approved the course for 'socialist reforms' (land reform, nationalization of foreign trade, banks, etc.). Subsequently, the government of Houari Boumediene began placing great emphasis on nationalism. In the 'National Charter' (1976), the principle of 'self-reliance' was stressed and Islam was proclaimed the state religion. In the revised version of the charter (1986), a more important role was given to private national capital.

## Nationalism in Latin America

Processes of national awakening in Latin America had a unique character. By the beginning of the nineteenth century, colonialism in Latin America had not paved the way for any of the usual prerequisites for the emergence of nationalism. The independence gained between 1810 and 1926 by most of the Latin American countries resulted primarily from European events – Napoleon's occupation of Spain and Portugal and the overthrow of the long-standing monarchies. Consequently, independence did not reflect the emergence of national states, and the process of the formation of nations was a lengthy one.

At the beginning of the twentieth century, cultural nationalism prevailed; however, before long, a more efficient form emerged. The so-called 'economic nationalism' proclaimed the priority of the nation's ownership of all land, water and natural resources (Mexican Constitution of 1917). In practice, it resulted in the establishment of large state corporations and the nationalization of basic industries, the policy of industrialization, and the introduction of restrictions on the activities of foreign capital (Argentina, Mexico, Chile and Brazil). This type of nationalism represented a compromise between the semi-colonial cosmopolitism of the old ruling circles and radical nationalists, who disclaimed the role of external factors. It was oriented toward domestic

*Map 5* **Colonization in Africa**

**Independence in Africa**
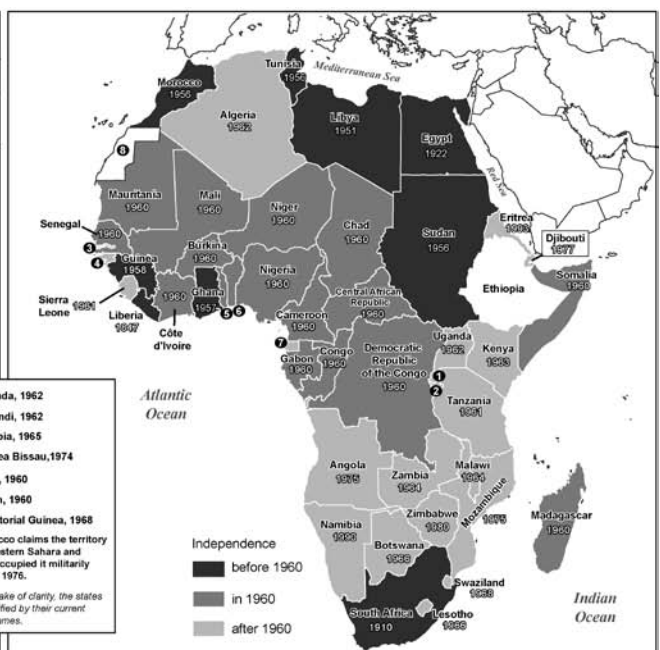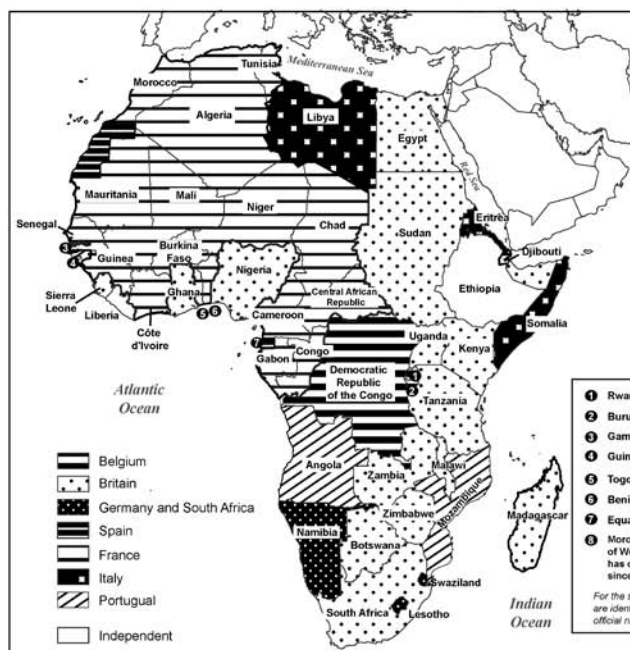
production and consumption, but for the sake of successful economic development, the rational use of foreign investments and assistance was also advocated.

The Pan-Continentalism movement originated in the course of the liberation struggle and was initially directed against Spain and Portugal. Led by Simon Bolivar, it assumed the spirit of continental unity – *americanismo*. Later on, the idea of continentalism acquired a new base – *anti-yankeeism* (directed against the United States) – particularly after the Mexican War and as a consequence of a broad interpretation of the Monroe Doctrine. In the 1930s and 1940s, the United States made an attempt to assuage those negative attitudes and to weaken Latin American continentalism through the concept and the policy of 'multilateralism'.

## DIFFERENT MODELS OF SOCIALISM

The upsurge of liberation movements and the collapse of the colonial system were played out within the framework of the confrontation between two systems. As a consequence, in a number of the countries, communist parties managed to take over the leadership of liberation movements, thereby facilitating their rise to power.

### China

After the People's Republic of China was founded there was some disagreement among the leaders of the country's Communist Party: some advocating following Stalin's model while others remained faithful to Lenin's 'New Economic Policy'. The unique feature of the socio-economic policy of the new Chinese leadership was the way it dealt with its bourgeoisie (creation of mixed state-private enterprises, policy of redemption of the private capital, etc.). Subsequently, the development of Chinese society began to follow the tenets of Maoism. In 1958 and 1959, Mao Zedong undertook the 'Great Leap Forward' that resulted in the establishment of rural communes and in large-scale industrialization (Plate 39). The country strove to achieve self-reliance and the level of highly developed capitalist countries. From 1966 to 1976, the 'Great Proletarian Cultural Revolution' against 'old ideas, old culture, old habits and old customs' was launched. However, after Mao's death (1976) and Deng Xiaoping's return to power, radical economic reforms were undertaken, though the Communist Party retained its leading political role. China is now in the process of establishing a socialist market economy.

### Viet Nam

Vietnamese socialism emerged from the flames of the armed liberation struggle that lasted for 35 years (initially against Japanese occupation, then against French colonialism and lastly against the military intervention of the United States). From the very beginning of the struggle the Communist Party managed to organize a broad national front – Viet Nam Independence League (or Viet Minh). As the nucleus of that front, the Communist Party did not bring forward any socialist slogans and pursued a rather flexible social policy that brought it mass support, particularly from the peasants.

Before reunification with South Viet Nam, the country's social development could be described as the synthesis of the Soviet political system and a 'war communism' type of economy. In 1979, the leaders of the country made the first fundamental revision to their development strategy. More emphasis was placed on material incentives, private enterprise, expansion of the market for consumer goods, etc. In 1986, a new programme of liberalization of the economy was adopted. The main objective of the programme was industrialization and modernization, the granting of privileges to private capital and drastic reductions in the state sector. As a result of a new law on foreign investments adopted in 1987, the economy became more open.

### Cuba

Perhaps the main peculiarity of the socialist regime in Cuba is the fact that the policy of the United States had a dominant role in its genesis and development. Fidel Castro, who since 1956 had led the partisan war against the dictatorial regime of Batista and came to power on 1 January 1959, was a radical nationalist who did not share communist convictions. From the very beginning, the United States took an extremely negative attitude towards the Castro regime. In January 1961, it broke off diplomatic relations with Cuba and imposed a diplomatic and economic blockade on the island. In April, they organized the Bay of Pigs landing operation. All these actions pushed Castro to the left and made him seek allies in the socialist camp. Castroism differed from both the Soviet model, distinguished by the important role of the Communist Party and a preliminary organization of the proletariat for the seizure of political power, and from the Chinese model, according to which the Communist Party joined the United Front, which encompassed the proletariat and the peasantry as well as the bourgeoisie. Castro and his followers in Latin America (Fidelistas) believed that in order to overthrow a corrupt dictator, it sufficed to organize a guerrilla war in rural and urban areas.

Among the early features of Cuba's distinctive brand of socialism was total disregard for the principle of material incentives and an emphasis on moral incentives. However, Cuban leaders eventually had to abandon such policies and, from the late 1960s, the features of the Soviet model became more and more prominent in the country's social development. After the end of the Cold War, Cuba found itself in a crisis situation that impelled the leaders of the country to start developing a mixed economy.

### Nationalist socialism

From the very start of their activities, a large number of the national leaders of liberation movements came under the influence of socialist ideas. However, practically all of them combined the general idea of socialism with their specific types of nationalism and traditionalism.

### Indonesian socialism

The ideology and practice of Indonesian socialism is connected with the name of the country's first president,

Achmed Sukarno (Plate 40). It is based on five principles known as 'Pancasila': nationalism, internationalism, democracy, social justice, belief in God. Alleging that Western liberal democracy was inapplicable to Indonesia, in 1957 Sukarno proposed the system of 'Guided Democracy' on the basis of which he formed a Mutual Cooperation Cabinet (Goton Royon Cabinet). Soon afterwards, the concept of 'Indonesian socialism' was supplemented by the ideas of NASAKOM (an acronym for: nationalism, religion and communism). The external aspect of 'Indonesian socialism' was radical anti-colonialism, anti-neocolonialism and anti-imperialism.

## Arab socialism, the Baath movement

Originating in Syria in 1953, this movement appealed to the poor, landless peasants for support against foreign influence and big landowners. It encouraged the nationalization of industry but also favoured private property and enterprises in the hopes of improving general social welfare. The Baath motto was 'Unity – Freedom – Socialism', 'Unity' referring to a single centralized Arab State and 'Socialism' being the economic essence of Arab socialism, which was essentially nationalist and bound to serve the Arab nationalist cause.

## Bandung and the 'Third World' concept

Almost immediately after the emergence of new independent states, they became an object of confrontation between the 'two world systems'. At first, the prevailing opinion in the West (particularly in the United States) was that the former colonial and dependent countries should embark upon the path of modernization and Westernization (Edward Shils, Lucian W. Pye, David E. Apter, S. P. Huntington, S. N. Eisenstadt and others). The Soviet bloc believed that liberation revolutions would not end at the nationalist stage and would develop into social revolutions. The African and Asian countries considered that they were trying to become an independent part of the world community. The Afro-Asian conference in Bandung (Indonesia) was a landmark in the history of newly independent states. Among the participants of the conference – convened in April 1955 on the initiative of Indonesia, India, Pakistan, Sri Lanka and Burma – were such prominent political figures as Sukarno, Nehru, Zhou Enlai, Pham Van Dong and Norodom Sihanouk. Representatives of 29 Asian and African countries approved 10 principles of international cooperation.

Initially, the term 'Third World' (*le tiers monde*), referring to a particular world community, was widely used in France (A. Sauvy, G. Balandier), and subsequently around the world, to distinguish developing countries from the 'First' (developed countries) and 'Second' (socialist countries) 'Worlds'. Later on, as a synonym of the 'Third World', the term 'the South' (as opposed to 'the North') was introduced. During the 1960s and 1970s, attempts were made to use the criteria of under-development and poverty for classifying the countries of the Third World. However, with the process of differentiation between developing countries accelerating, all these attempts were doomed to failure. Within the United Nations and its agencies the term 'Fourth World' was coined.

## Non-Aligned Movement (NAM)

The idea of non-alignment has roots in the socio-political and religious-philosophical teaching of Mahatma Gandhi. A distinctive feature of Gandhi's philosophy is the necessity of mass non-violent resistance to colonialism ('Satyagraha' or truth grasping) and using the strength of one's mind against brute material force. Jawaharlal Nehru (Plate 41) transferred the basic principles of Ghandi's teachings to the sphere of foreign policy. In July 1956, on the island of Brioni (Yugoslavia) I. Tito, J. Nehru and G. A. Nasser signed the declaration that proclaimed the principles of the Non-Aligned Movement. In 1961, 25 state and government leaders of the non-aligned countries gathered in Belgrade for their first conference, which formulated the movement's three main goals: scaling down global confrontation, the struggle against colonialism, and economic development.

The movement emerged as a reaction to the Cold War and the rigid bipolarity of the world in the 1950s. At that time, even large developing countries were not able to effectively counteract pressure from the superpowers and resist being drawn into military-political blocs (the Baghdad Pact, CENTO, SEATO, etc.). For this reason, certain countries decided to resort to collective diplomacy under the banner of the Non-Aligned Movement (Plate 42). The Second NAM conference, which took place in Cairo in 1964, put forward the idea of forming the Group of 77, which was established at the UNCTAD conference the same year. The fourth conference, held in Algeria (1973), adopted the Declaration and the Programme of the New International Economic Order (NIEO). The following year, a special session of the United Nations General Assembly approved the Declaration establishing the NIEO.

By the early 1990s, 10 conferences of the NAM had taken place, and its membership rose to 111 countries in 1995. However, after the Cold War ended, the NAM found itself in an entirely new environment: political decolonization had been completed, developing countries had become increasingly differentiated, and the internal fragmentation within the movement was intensifying. Regionalization and the formation of a multi-centred world structure had begun. The NAM was confronted with the need to reconsider its objectives, strategies and, probably, even its very existence.

## The Suez Canal and the Persian Gulf

During the entire twentieth century, the Middle East had been in the spotlight of world public opinion and the centre of conflicts between various geopolitical, military and economic interests. Already considered strategic in 1869 at the opening of the Suez Canal, the region acquired even greater importance in the twentieth century when new oil deposits were discovered there.

The Suez Canal is one of only four international passages linking two seas. After the Egyptian revolution of 1952, the British troops remained in the canal zone until July 1956. By that time, Egypt's relations with the West had grown rather tense. Among the factors that contributed to the West's negative attitude towards Egypt was the independent course pursued by Nasser, his role as the undisputed leader of the liberation movement in the Arab world, and Egypt's cooperation with socialist countries. In 1956, the United States and England refused to finance the construction of

*Map 6* **United Nations Partition Plan (1947)**

*Map 7* **The Armistice Agreements (1949)**

*Map 8* **Israel and the Occupied Territories (1999)**
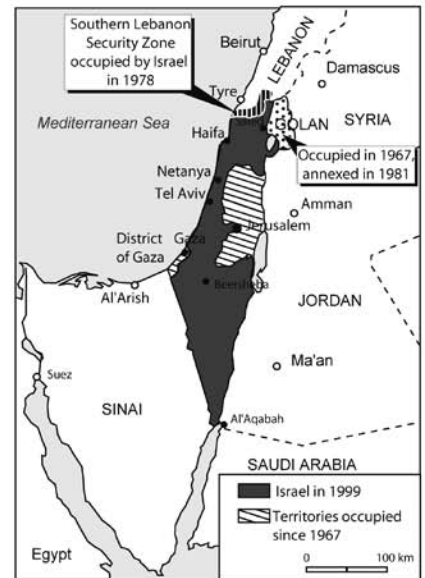


Adapted from E. Barnavi, 1982, *Israël au XXᵉ siècle*, PUF, Paris, pp. 318–19.

the Aswan High Dam, despite their earlier promises. In response, Nasser nationalized the canal, intending to use the revenue to finance the construction of the dam. England, France and Israel retaliated by occupying the canal zone. In a statement issued 5 November 1956, the Government of the Union of Soviet Socialist Republics demanded that military operations be stopped and foreign troops withdrawn. The United States also decided not to support their allies. As a result, foreign troops left Egypt in March 1957.

Today, the Persian Gulf is considered the world's most critical sea route: two-thirds of the world's oil exports travel through the Gulf en route to consumers. For the past two decades, at least two major conflicts of global importance have broken out in the Gulf region.

The Iran-Iraq War lasted eight years (September 1980–August 1988), and many problems resulting from it remained unresolved in the early twenty-first century. The rivalry between Iran and Iraq in the Gulf has a very long history. The dispute over Iran's right to use Shatt al-Arab waterway had been settled in 1975 in favour of Iran. After Iran's Islamic Revolution, Iraq decided to break the accords of 1975 by attempting to win back oil-rich Khuzistan, conquered by Iran in 1925. In September 1980, Iraqi troops invaded Iranian territory, making it clear that the war would be protracted. A cease-fire signed by both sides in August 1988 put an end to the fighting.

The second war in the Gulf began in August 1990, soon after the previous conflict, when Saddam Hussein invaded Kuwait and proclaimed it Iraq's nineteenth province. The Soviet Union joined the international community in strongly condemning this act of aggression. The United States initiated the creation of a multinational Allied coalition, which consisted primarily of Americans (532,000 soldiers).

The United Nations Security Council condemned the invasion and adopted a resolution to impose economic sanctions on Iraq. It demanded unconditional withdrawal of Iraqi troops from Kuwait and acknowledged the latter's sovereignty. Moscow's attempts to find a compromise political solution ended in failure. Operation Desert Storm, launched on 24 February 1991, succeeded in defeating the Iraqi troops.

**Palestine and the creation of Israel**

The Palestine issue is perhaps the oldest problem in the Middle East. In the Balfour Declaration, issued in November 1917, Great Britain committed to support the establishment of a Jewish national homeland in Palestine. Subsequently, Jewish immigration rapidly increased, especially between 1932 and 1938 owing to the persecution of Jews by Nazi Germany. Indeed, the Holocaust contributed tremendously to Jewish immigration to Palestine: by 1945, some 564,000 Jews were living in Palestine. In 1947, the United Nations General Assembly adopted the Partition Resolution, which provided for the division of Palestine into two states: one Arab and the other Jewish (the resolution was supported by the United States and the Soviet Union) (Map 6). The Arab state was never established, while the creation of the State of Israel was proclaimed in May 1948 and was immediately followed by the first Arab-Israeli War (1948–1949) (Map 7). As a result of that conflict, Israel not only retained all of its territory but also seized part of the territory that had been apportioned to the Arab state. The remaining part of the territory was annexed by Jordan (the West Bank and East Jerusalem) and Egypt (the Gaza Strip). In 1964, the Palestine Liberation Organization (PLO) was established. In October 1974, the United Nations General Assembly voted to officially recognize the PLO as the sole representative of the Palestinian people by an overwhelming majority (105 against 4).

Soon after the Camp David Accords (1978) and the Egyptian-Israeli Peace Treaty (1979) were signed, the Israeli

Parliament (Knesset) officially legitimized the annexation of East Jerusalem, and in the summer of 1982, Israel invaded Lebanon to drive out PLO leaders and its armed forces. Only in September 1993 did both sides finally sign the Oslo Accords, which called for the transfer of power over the West Bank and the Gaza Strip to the Palestinians. For various reasons however, the Oslo Accords failed, and by the century's end, no solution appeared in sight (Map 8).

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# 5

## POST-COLONIAL PROBLEMS
## FORMER COLONIAL POWERS
## AND NEW STATES

*Nodari A. Simonia*

### RACISM, COLONIALISM AND THEIR CONSEQUENCES

Colonialism destroyed the integrity of traditional life and the natural interplay between people and nature, and slavery was revived in order to provide plantations and mines with inexpensive manpower. Up to 10 million black people from Africa were resettled in the West Indies, the Americas, thereby generating a number of serious problems, some of which have yet to be solved. Africa itself was divided into three zones (Samir Amin): (a) Africa of the labour reserves; (b) Africa of the colonial trade economy; and (c) Africa of the concession-owning companies.

In fact, European expansion resulted in the formation of three types of colonies: (1) colonies governed by European countries, (2) 'colonies' inside the mother countries (the United States and a few Latin American countries), and (3) colonies with fragments of mother countries within (South Africa, South Rhodesia).

In all cases, colonialism gave rise to racism, racial discrimination and segregation. The first type of colonies solved this problem upon gaining independence. The United States, which started the process of combating racism during the Civil War (1861–65), became the scene of race riots and disorders in the decades following the Second World War. (The murder of the Nobel Peace Prize winner Martin Luther King [Plate 43] in 1968 provoked racial unrest in some 125 towns across 29 US states.)

However, the struggle against racism was the most fierce and bloody in the Republic of South Africa. Legalization of racism, which formed the basis of the state system of apartheid, actually began with the establishment of the Union of South Africa (1910) and continued after it joined the British Commonwealth (1931). When the coalition of Afrikaner nationalists came to power in 1948 and the National Party was formed in 1951, the regime, based on the Afrikaner peoples' belief in their 'god-given mission', was finally and totally legitimized (Plate 44). After the adoption of the Bill on Bantustans (1959), 73 per cent of the black population became citizens of 10 Bantustans (reservations), to which 13 per cent of the most barren land was allotted. Since that time, the African peoples' struggle for liberation acquired greater radicalism, with landmarks events such as the Sharperville massacre (1960) and the Soweto uprising (1976). Beginning in the mid 1980s, the country was in a state of a civil war. In the end, the ruling regime had to begin negotiations with the main opposition force – the African National Congress and its leader Nelson Rolihlahla Mandela who had served over 27 years in jail. After the first free and general elections in May 1994, the regime of apartheid collapsed.

### Fragmentation

One of the extremely negative consequences of colonialism was political, social, ethnic, religious, economic and cultural fragmentation of developing societies. Among the principal factors of fragmentation were artificial borders drawn by the colonialists. Even when they were withdrawing from colonies, Western powers tried to change the borders to their own advantage as exemplified by the division of the Indian subcontinent on the basis of the region's prevailing religious differences, the United States of Indonesia imposed by Holland (1949–51), the Malayan Federation, and attempts to form various federations in Africa. African territories were divided without regard for the ethnic groups and the emerging state entities. As a result, the new political entities brought together fragments of different ethnic groups (Bacongo, Ewe, Masai, Yoruba in Central, West and East Africa and many others), thus setting the stage for both conflicts between neighbouring states (between Chad and Libya, Zaire and Angola, Burkina Faso and Mali, Somalia and Kenya, Somalia and Ethiopia, etc.) as well as internal clashes that sometimes developed into civil wars (Nigeria, Ivory Coast, Sudan, Zaire, Ethiopia). In a number of cases, they even escalated into veritable genocide, as occurred between the ethnic groups of Tutsi and Hutu in Rwanda (1959 and 1994) and Burundi (1972 and 1993–94).

Ethnic diversity leads to political fragmentation: the struggle between different ethnic groups for power, status, possession of economic resources, etc. The existence of multiple loyalties (family, clan, tribal, state) complicates political processes, impedes the process of governing and destabilizes society. The above-mentioned factors also

account for social fragmentation and for the fact that the formation of classes and civil society will be a long process. Ethnic fragmentation is often combined with religious fragmentation, which creates additional difficulties. These contradictions are also aggravated by the fact that during the colonial period, many peoples and ethnic groups in Africa lived in the sphere of influence of different European cultures (English, French or Spanish is spoken in most former colonies). In addition, the formation of modern society in the former colonial countries also encounters economic fragmentation, the absence or weakness of the domestic market, enclave economic development, causing social tension and at times regional separatism.

## THE PROBLEM OF MINORITIES

Ethnic fragmentation poses a particularly serious problem whenever minorities reach a comparatively high level of self-identification and political consciousness. As a rule, their assimilation by the dominant nation becomes rather difficult, and in some cases impossible. Almost from the outset of independence, such minorities wage an unrelenting struggle for self-determination. As a rule, their struggle begins with demands for cultural and administrative autonomy, but having met with opposition from the central power, they radicalize their struggle and begin to demand secession (separatism).

The problem of minorities sometimes involves exclusively internal affairs of the concerned state. In other cases, the minority is scattered across two or even several neighbouring states, adding a regional dimension to the problem. An example of the former case is the Sudan, where Nilot tribes in the southern part of the country waged an armed struggle from 1955 to 1972 and finally achieved autonomy and self-government (Plate 45). Another example is the Igbo's attempt to secede from Nigeria (1967–70) to create an independent Biafra. The resistance was repressed, but in order to prevent new attempts of separatism, federalism was instituted in Nigeria. The only example of separatism brought to completion in Africa is Eritrea, which seceded from Ethiopia in 1991, as a result of an armed struggle waged since the early 1960s.

More complex is the problem of fragmented minorities. The governments of the region usually manipulate such minorities. A classical example is the destiny of the Kurds, who live primarily in Iraq, Turkey, Iran, Syria and Azerbaijan. After the First World War, the Western powers decided to establish a Kurdish state (Sevres Treaty, 1920), but this promise was never fulfilled. The destiny of the Bengalese people is also noteworthy. After the division of colonial India, the majority of the Muslim population found itself in Pakistan, while the Hindus were predominantly settled in India. Since the first days of independence, the Bengalese in Pakistan had been slighted and exploited by the Urdu-speaking population of the western part of the country. This eventually led to a civil war and the establishment of the Republic of Bangladesh.

### Dependence

Political liberation by no means eliminated economic, technological and military-political dependence of the developing countries. Generally speaking, colonialism destroyed the integrity of their economies. Certain local structures maintained the colonial division of labour in collaboration with the mother country, while others perpetuated a stagnating farming tradition. Plantation farming, peasant commercial production and mining enterprises continue to be export-oriented up to the present day. The entire infrastructure was created in such a way that the colony's economy was more closely connected with the mother country than with the other regions of the colony.

One of the most vivid manifestations of economic dependence is the monocultural character of production. In the 1960s, about 70 independent states relied on the export of one to three primary commodities or minerals (oil, copper, bauxite, etc.), agricultural commodities (cotton, jute, rubber, copra, etc.) or foodstuffs (coffee beans, peanuts, cocoa beans, tea, bananas, rice, citrus fruits). This policy laid the foundation for the subsequent marginalization of certain countries and was responsible for the crises from the 1970s to the 1990s, which were aggravated by a slump in raw materials prices and a rise in the prices of industrial imports. The technological revolution passed those countries by, and Western countries made investments mainly in their own economies or in a small number of developing countries. As a result, from 1980 to 1991, the 42 least-developed countries registered a negative average annual growth of the GNP per capita (-5.4 per cent), while 10 low-income and 20 medium-income countries also had negative or zero growth. The efforts of the International Monetary Fund (IMF) and the World Bank to apply 'structural adjustment' measures to such countries were unsuccessful because these organizations did not envisage the overall restructuring of production, the elimination of their economies' dualism and their conversion into national economies based on the domestic market.

However, even those countries that had taken the path of industrialization for many decades remained technologically dependent (on the importing of equipment, technical assistance, capital investment, patent and license purchases). Moreover, the number of scientists and engineers in the Third World engaged in research and development ranged from 4 to 16 per 100,000 people from 1970 to 1976 (compared to 124 to 240 in developed countries). In the mid-1970s, developing countries accounted for only 2 to 3 per cent of the world expenditures for research and development.

Developing countries are also dependent on wealthier nations in the military-political sphere. Here we can observe the logic of the 'vicious circle': a difficult economic situation, political instability, local and regional conflicts lead to a substantial increase in military spending and the import of armaments, which, in turn, drastically reduces the potential for investment in production and further deteriorates the economic situation. The value of armaments imported from developed countries to the Third World totalled US$4.2 billion in 1960 and rose to US$16.5 billion in 1991.

### Poverty

Although destitution and poverty occurs in highly developed Western countries, the nature of these phenomena is fundamentally different in developing countries. As a result of the socio-economic dualism imposed by colonialism, up to 70 to 75 per cent of the population has remained in the

traditional agricultural sector, which has been traditionally exploited (taxes, supplies of low-price foodstuffs, forced labour at the construction of public project, etc.). During the first decades of independence, this state of affairs changed very little, partly owing to the Western concept of promoting industrialization at the expense of the agricultural sector. Therefore, it is hardly surprising that many rural areas fell into a state of degradation and per capita output of foodstuffs drastically decreased. From 1952 to 1962, the average annual growth of foodstuffs output amounted to 0.7 per cent; by contrast, from 1962 to 1972, it decreased to a mere 0.2 per cent. According to the World Bank, in the mid 1970s, about 85 per cent of the poor were concentrated in rural areas.

Pauperization of the rural population has contributed to large-scale migration to urban areas, a process that can be defined as 'galloping urbanization'. Numerous slums are emerging in cities and their surrounding suburbs. According to the United Nations, the urban population of Africa in 1950 totalled 33 million people (14.5 per cent of the total population); by 1985, it had risen to 174 million people (31.1 per cent). In Latin America, the urban population numbered 69 million people (41.5 per cent) in 1950 and 279 million people (62.2 per cent) in 1985; in Asia, 226 million (16.4 per cent) and 797 million (28.1 per cent) during the same years. In the mid-1980s, over a dozen megalopolises emerged: ten of them with a population of more than 3 million people while the four largest comprised over 10 million. Thus, in the 'Third World' poverty has become an urban problem as well (Plate 46).

Available data indicate that, at least in absolute terms, poverty in the 'Third World' is not decreasing but growing (in a few countries, poverty has also increased in relative terms). In 1971, when the United Nations published the list of the least-developed countries, it included 25 countries; 10 years later there were already 31 such countries, and in 1990, the 'Fourth World' comprised 42 states with a combined population of 400 million people. The number of poor people in the other countries of the 'Third World' was comparable. Half of all poor people live in South Asia: 560 million people or 49 per cent of the total population in 1990. In Central America, about 60 per cent of the population live in poverty. The situation is particularly critical in sub-Saharan Africa, the only region in the world where the growth of agricultural production lags behind the population growth and where the Overseas Development Administration (ODA) meets not only its basic foreign exchange needs but also most domestic investment requirements and, increasingly, recurrent costs. On the whole, according to the World Bank's estimates, the number of people that are not able to satisfy their essential needs (food, drinking water, sanitation, health care and education) exceeded 1.1 billion in the early 1990s.

### Displacement of Peoples

All the factors listed above gave rise to the phenomenon of large-scale migration in the twentieth century. Two types of

*Map 9*  **Principal migratory movements at the end of the Twentieth Century**
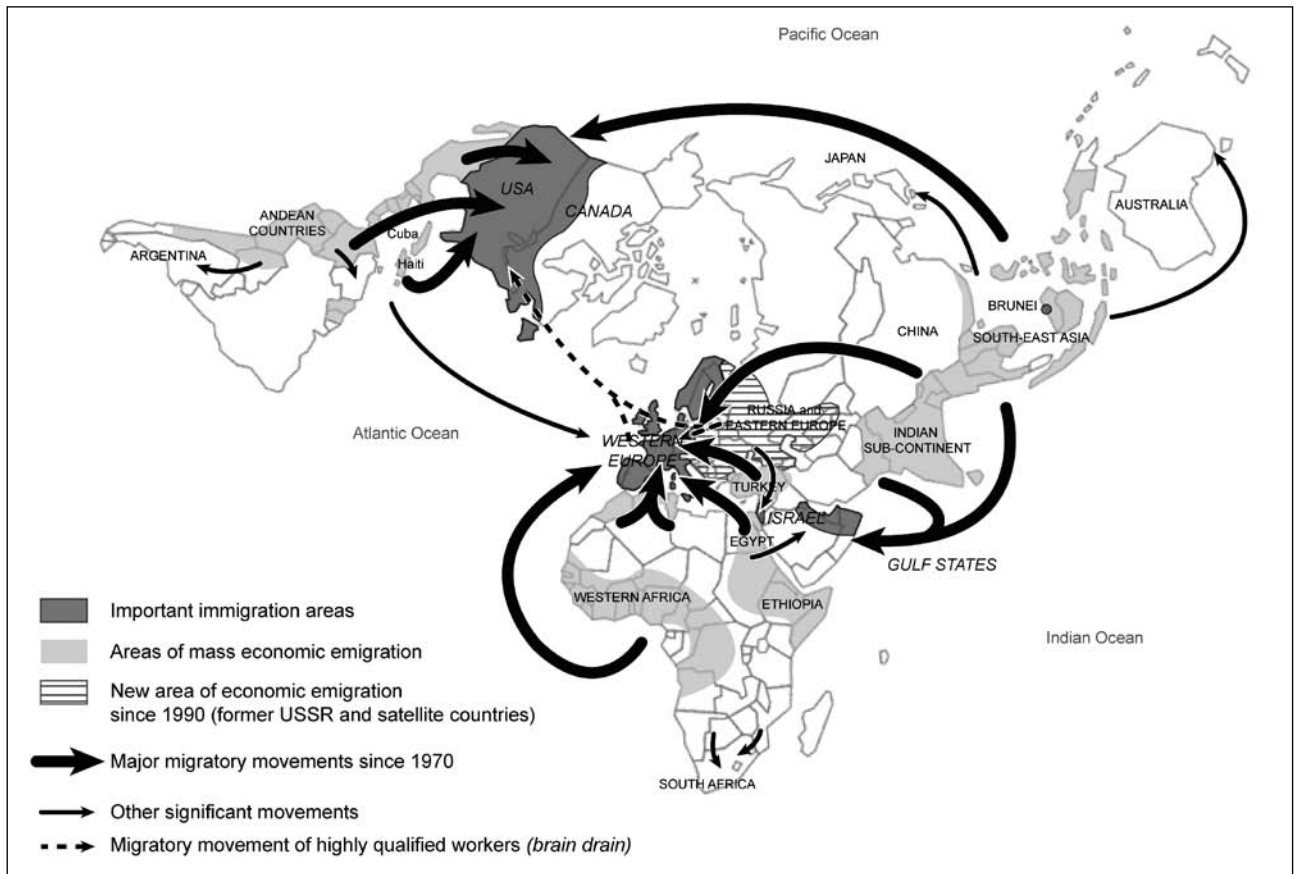


Adapted from G. Chaliand et al., 1998, *Atlas du millénaire: La mort des empires 1900–2015*, Hachette, Paris.

causes can be singled out: military-political violence and socio-economic needs. Violence gave rise to a problem of refugees and internally displaced people. During the past decade, the number of such people has grown drastically, and the problem has acquired a global character. According to the data furnished by the Office of the United Nations High Commissioner for Refugees, in the mid-1980s, the total number of refugees worldwide was 10 million. In 1991, World Refugee Survey estimated that there were at least 20 million internally displaced and 16 million refugees. This process began with decolonization. Mass flows of forced migrants could be observed during the division of colonial India (Plate 47) or the period of the British mandate over Palestine. The war in Indochina brought about a new wave of refugees (about 1.3 million people emigrated from Viet Nam alone). Up to 6 million Afghan people left their country, and another 2 million were forced to move to other regions because of the Soviet Union's armed intervention in Afghanistan. In the 1990s, Africa accounted for about a quarter of the total number of migrants: about 1 million people fled from Ethiopia and another million were internally displaced; in Mozambique, 1.4 million emigrated and 2 million were internally displaced. In 1994, 2 million refugees fled from Rwanda. In Sierra Leone, there were 400,000 internally displaced, and an additional 380,000 were forced to seek shelter in Guinea and Liberia. In their turn, 400,000 Liberians settled in Sierra Leone, 600,000 in Guinea and 250,000 in the Côte d'Ivoire.

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# 6

# RESPONSES TO POST-COLONIAL PROBLEMS

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## GARVEYISM, 'NEGRITUDE' AND BLACK POWER

Awakening of racial self-consciousness of black people was a natural response to centuries of colonial oppression and white peoples' belief in the universality and superiority of their culture. One of the earliest manifestations of such a response in the twentieth century was Garveyism. Marcus Garvey, a native of Jamaica, where he is considered a national hero, founded the Universal Negro Improvement Association (1914). In 1917, Garvey moved to Harlem in New York City, where he became a political activitist and launched the 'Back to Africa' movement. Garveyism represented radical anti-colonialism and anti-racism. It maintained the dignity of the Negro race, without idealizing its history and culture. Garvey advocated racial purity and considered mulattoes as 'traitors of the Negro race'. His vision was to encourage black people to 'buy black' by supporting the business of black entrepreneurs. Eventually, he founded the Black Star Shipping Line to foster trade and black emigration from North America to Liberia and Ethiopia in the hope of creating an independent African state as a base for the continent's liberation.

Whereas Garveyism was widespread in English-speaking Africa (Liberia, Nigeria, Sierra Leone), the concept of *négritude* (blackness) was popular mainly in the former French possessions. The concept was advocated by Aimé Césaire, from Martinique, but the figure who greatly contributed to the theoretical content of negritude was Leopold S. Senghor, who eventually became president of Senegal and a prominent International Socialist. Initially negritude was an intellectual reaction to France's assimilation policy. Senghor defined the concept as follows: '*Négritude* is the whole complex of civilized values – cultural, economic, social and political – that characterize the black people'.[1] According to negritude, black Africans, by virtue of their racial origin and the particularities of their culture, perceive the world in their own unique way and subconsciously communicate to each other the psychological experience of the black people. According to Senghor's concept, the innate intuition and sensuality of the Africans contrasts with the cold rationalism of Westerners. After the Second World War, the concept became popular among the writers of Africa, Europe and the Caribbean.

Negritude had a marked effect on numerous movements advocating black nationalism and black consciousness that were widespread in the 1960s and 1970s. In Haiti, black intellectuals waged a successful campaign for the recognition of Creole, the language of the masses, as an official national language (1969), on equal footing with French, the language of the elite. In the United States, a number of moderate and radical movements coined the 'Black Power' slogan. It was also used by the Nation of Islam (also known as the Black Muslim movement), founded in the 1930s and led by Elijah Muhammad from 1934 to his death in 1975, at which time the supporters of the movement numbered some 150,000 to 200,000. Another proponent of 'black power' was Stokeley Carmichael, the leader of an extremist students' organization who alleged that 'black power' was the movement that would destroy everything created by white civilization. Another leader of a radical movement – Floyd B. McKissick – considered the seizure of power as the only way to bring about serious changes in society.

## AFRICAN SOCIALISM

African socialism was widespread on the continent after independence. African leaders of the first generation such as Julius Nyerere, Kwame Nkrumah, Modibo Keita, A. Sekou Touré and Kenneth Kaunda viewed independence as an opportunity to build a new society, free from the colonial legacy. They associated capitalism with colonialism and believed that traditional African society possessed socialist features, including communal land-tenure, large families, kinship ties, a conviction that nobody should starve if others have food, precedence of cooperation over competition and group interests over individual ones. They considered that there were objective prerequisites for the spreading of such a concept: for example they noted that capitalism practically did not take

root in Africa, the bourgeoisie and the working class were 'in embryo' and vast strata of traditional society still remained in rural areas. Under such conditions many leaders, striving to achieve their egalitarian goals and ideas, relied on the state as the only serious force capable of managing the economy and the process of socio-economic decolonization, as well as moulding the self-consciousness of the people and securing the integrity of the nation-state. African socialism differs both from socialism of the Western social-democratic type (L. Senghor, J. Kenyatta) and from 'Marxist-Leninist' regimes (S. Machel and J. Chissano in Mozambique, Mengistu Haile Mariam in Ethiopia, A. Neto and E. dos Santos in Angola, M. Kerekou in Benin), since it does not recognize class struggle, the ideology of Marxism, atheism, etc.

## POPULIST MOVEMENTS AND DICTATORIAL REGIMES IN LATIN AMERICA

During the first decades of the twentieth-century, socio-economic changes in Latin American countries led to an enhanced role of urban areas, industry, the bourgeoisie and the working class. This undermined the dominating position of *latifundistas* (large land-owners), broke the traditional social consensus and led to political destabilization. In the 1930s and the 1940s, in such countries as Brazil or Argentina, a grave structural crisis developed, giving rise to populist regimes and movements. In Brazil, the parliamentary oligarchy of *latifundistas* was undermined by the revolution from above in 1930, and during the subsequent 15 years, the country was ruled by the populist leader, Getulio Vargas. General Juan Domingo Peron, having ousted the military junta, became the absolute dictator of Argentina (1946–55). Both of the populist regimes relied on the support of the middle classes, trade unions and migrants from rural areas and performed two principal social functions: (a) mobilization of the masses against the domination of the traditional oligarchy and clearing the way for national capitalism and (b) opposition to and suppression of extremist political trends (Vargas, for instance, crushed the leftist uprising in 1935 and the fascist putsch in 1938).

After the Second World War, populism tried to carry out import-substitute industrialization in Latin America. However, this strategy did not fulfil expectations. While Latin American countries were trying to catch up with the industrialized countries, the technological revolution in the developed countries propelled them to a post-industrial level. In other words, the dependency remained. At the same time that industrialization gave birth to new social contradictions, mass disappointment, caused by unrealistic expectations, put those countries on the brink of a new structural crisis. In response to the latter, military coups were carried out and bureaucratic authoritarian regimes established in Brazil (1964), Argentina (1966), Peru (1968), Chile and Uruguay (1973). These regimes were different from both traditional caudillo-type and populist dictatorships, and not only because the army came to power as an institution rather than for the sake of installing a new dictator. The principal distinction lies in the fact that these regimes had to solve the complex task of combining ordinary industrialization with post-industrial technological

revolution. It was also necessary to find a 'golden mean' between the previous economic nationalism that characterized the 'catching-up' industrialization on the one hand and the transnational cosmopolitism of the technological revolution's productive forces on the other. Hence the suppression of liberalism and the distancing of the masses from active political life.

## RELIGIOUS AND SECULAR MOVEMENTS IN AFRICA

Political-religious movements were an initial form of protest and organization of African masses. The largest of such movements – Kimbanguism – emerged in 1921 in Belgian Congo (Democratic Republic of Congo) in the form of a Protestant heresy. Named in honour of its founder, the priest Simon Kimbangu, the movement advocated passive disobedience, but when its followers began to refuse to work and to pay taxes the authorities put Kimbangu in jail, where he spent 30 years until his death in 1951. Consequently, Kimbangu acquired martyr status and was considered the 'saviour of the black people' by his followers, who associate him with Moses, Jesus, Muhammad and Buddha. Kimbanguism contributed to the emergence of another, more active anti-colonial movement in Belgian Congo named Kitawaia, which clearly voiced political protest. Both movements were to a certain extent influenced by the 'Watch Tower' movement, which had originated in the United States and transferred at the beginning of the twentieth century to Nyasaland (Malawi) before spreading to Zaire, Zambia and Zimbabwe.

There also existed secular anti-colonial movements. In the Republic of South Africa, Robert Sobukwe, founder of the Pan-Africanist Congress (1959), in 1960 put forward the concept of 'black consciousness'. He placed emphasis on 'black' instead of multi-racial solidarity, insisted on the 'Pan-African' rather than 'South African' nation, and took a more militant position than that of the African National Congress from which he had seceded. After his arrest, the concept of 'black consciousness' was adopted by the South African Students Organization (1969) headed by Steve Biko. The latter developed the concept and brought it to the level of Hegelian dialectics: 'black racism' should be counterposed to 'white racism', and only the conflict-confluence interplay of these two opposites can produce a viable synthesis of ideas and *modus vivendi*.

On the whole, liberation movements, thanks to which developing countries gained independence, were led by nationalists. However, independence did not automatically lead to social and economic self-sufficiency and, in the sphere of culture, foreign influence became even greater. Traditional foundations were destroyed before the new ones were set in place. Beginning in the 1970s, these transformations stirred up a new wave of religious revival. In Senegal, for instance, Murid marabouts expressed the peasants' discontent. In West Africa and the Sahel, numerous religious sects hostile to the ruling elites emerged. In the cities, the principal social base of religious revival was formed by migrants from rural areas, and particularly unemployed youth. New religious-political movements reflected the search for alternative survival strategies. Some of them have seriously challenged the existing regimes (e.g., the Islamic Salvation Front in Algeria).

## POST-COLONIAL REGIONAL AND CONTINENTAL INTEGRATION

For a number of understandable historical reasons, Latin America was the first to undergo the integration processes. However, soon after the Second World War, the United States attempted to conserve its dominant position in the region as well as the existing neo-colonial division of labour by initiating the establishment of the Organization of American States (OAS) in 1948. This, however, did not suit most Latin American countries, and they began to strive for integration without the participation of Western states. In 1960, Argentina, Brazil, Chile, Mexico, Paraguay, Peru and Uruguay established the Latin American Free Trade Association (LAFTA) and were subsequently joined by Bolivia (1966) and Venezuela (1967). As the more developed countries reaped the greatest advantages from LAFTA, the sub-regional Andean pact (Bolivia, Chile, Colombia, Ecuador, Peru and Venezuela) was formed within the framework of the Association in 1969.

In 1968, 11 Caribbean countries created the Caribbean Free Trade Association (CARIFTA). In 1973, they signed an agreement on the Organization of the Caribbean Community and Common Market (CARICOM). This event was significant because it marked the first time the process of integration evolved from a free-trade zone into a customs union (according to the model of the European Community) in the Third World. In the early 1990s, the Southern Cone Common Market (MERCOSUR) was also proclaimed. Its members intend to set up the Common Market and the Customs Union. At the same time, in recent years the concept of 'open regionalism' has become quite popular in Latin America. This was reflected in the results of the 'All-Americas' summit (34 participating states), which took place in Miami (USA) in December 1994. Participants reached full agreement on setting up a zone of free trade in the Western hemisphere by 2005 and progressively joining the North American Free Trade Agreement (NAFTA).

The processes of integration in Africa were even more complex. In 1963, 32 independent African states met in Addis Ababa to approve the Charter of the Organization of African Unity (OAU). This organization made an outstanding contribution to the processes of decolonization, the struggle against apartheid and neo-colonialism and African economic development. It went through periods of crisis in its development (particularly in the early 1980s) but managed to overcome them successfully and to remain the main exponent of African solidarity (Plate 48).

As to sub-regional integration processes, they were rather unstable until recently. Two noteworthy examples are the Central African Customs and Economic Union (UDEAC), established in 1966, and the East African Community (1967), which existed for only ten years. Attempts to consolidate the Economic Community of West African States (ECOWAS), which was formed in 1975 by 16 English- and French-speaking countries, were unsuccessful. Seven French-speaking countries (Burkina Faso, Côte d'Ivoire, Mali, Mauritania, Niger, Senegal and Dahomey, present-day Benin) set up their own Economic Community of West Africa within the framework of the ECOWAS. Recently the Economic and Monetary Union of Western Africa was finally established, however the Southern Africa Development Coordination Conference (SADCC), an organization set up in 1980 by Angola, Botswana, Lesotho, Malawi, Mozambique, Tanzania, Swaziland, Zambia and Zimbabwe, was much more effective. The collapse of the apartheid regime in South Africa will facilitate the integration of South Africa and Namibia into the southern African development community.

The first attempt at integration in Asia was not very successful. In 1964, Iran, Turkey and Pakistan formed the Regional Cooperation for Development. The revolution in Iran blocked the organization's activities, and, it was finally revived in 1985 as the Economic Cooperation Organization. In November 1992, the membership of the organization increased owing to the admission of Afghanistan and the former Soviet republics (Azerbaijan, Kazakhstan, Kirghizstan, Tadzhikistan, Turkmenia, Uzbekistan). In 1967, Indonesia, Malaysia, Singapore, Thailand and the Philippines founded the Association of South-East Asian Nations (ASEAN), but real cooperation started in 1970 (Brunei joined in 1984). Today it is the most effective and dynamically developing community in Asia, and it is likely to increase its membership at the expense of Indochina and Burma. In 1985, seven countries officially founded the South Asian Association for Regional Cooperation (SAARC). However, political differences between its principal participants constitute a significant hindrance to its successful activity. Nonetheless, the general framework of the Agreement on Preferential Trade Areas in South Asia was drawn up in March 1993.

## OLD AND NEW FORMS OF VIOLENCE

Violence has always been a part of everyday life in Third World countries. Colonialism itself was a synonym of violence, and liberation often began with revolutionary violence. During the first decades after the Second World War, violence was most often provoked 'from above' by belligerent leaders and organizations. For instance, the civil war in Colombia (1948–53), in which about 2 per cent of the population perished (mostly from the rural areas), was provoked by the clashes between the conservatives and the liberals in Bogotá, which, in their turn, were triggered by the assassination of the leader of the liberals. In 1965, clashes between the leftist forces and the right-wing generals in Indonesia escalated into a massacre that took the lives of about one million people. In Kampuchea, factional struggles between its leaders resulted in the genocide of entire social strata and groups of the population. In Rwanda and Burundi, ethnic conflicts between the Hutu and the Tutsi were often provoked by radical nationalist groups belonging to both sides. From 1993 to 1995 alone, approximately a million people were massacred in those clashes.

However, in the 1980s and 1990s, the phenomenon of mass violence resulted for first time from socio-economic, demographic and ecological considerations rather than factors related to ethnic, confessional and political fragmentation. The pauperization of the peasantry, the massive migration to the cities and the emergence of vast urban zones of poverty, high unemployment rates, the marginalization of entire social strata, the growing number of drug addicts, the spreading of numerous epidemics – these are some of the causes of new forms of violence, such as the formation of street gangs, drug rings, gambling groups

and organized crime networks, killing and the destruction of property. Such violence reigns in the streets and highways of Nigeria, Uganda, Zaire, Liberia, Sierra Leone, Ethiopia and Somalia. The major social base of such forms of violence is constituted by the destitute masses of migrants who lost their traditional way of life and were not able to adjust to the environment of quasi-modernized cities. They consider their involvement in criminal violence not as a step down to the 'bottom' of society but as a rise in their status. They perceive violence as the only attainable form of freedom.

New forms of violence are particularly dangerous because of their spontaneity and unpredictability. They do not have slogans or programmes. Violence in such cases is not a means but an end in itself and leads to criminal anarchy. In many cases, old and new forms of violence are superimposed and intertwined thereby further increasing violence. This phenomenon occurred on a large scale in Iran for the first time in the course of struggle against the monarchy. In Algeria, traditional confrontation between the Islamic fundamentalists and the authorities was reinforced in recent years by new social forces (migrants and unemployed young people from urban areas) and became the source of everyday mass violence and killings. In Pakistan, traditional contradictions between the Muhajirs (immigrants from India) and the local population, as well as between the Sunnites and the Shi'ites, became particularly explosive because of an inflow of migrants and refugees from Afghanistan to the cities (especially Karachi).

Today, unsolved national-ethnic, national-state and other problems are projected onto the world community in the form of international terrorism (hijacking of planes, capturing of ships and other transportation vehicles, hostage-taking, assaults on embassies and diplomats, bombings in the cities of Western countries, etc.). Moreover, today violence has reached a qualitatively new technological level. Terrorists are equipped not only with Kalashnikov sub-machine guns but with chemical weapons and electronic devices as well. World powers, which uncontrollably stockpiled arms in the Third World countries during the Cold War, also bear responsibility for this new level of violence.

## NOTE

1. L. S. Senghor, 'What is Negritude?', *Negro Digest*, April 1962, p. 4.

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# 7

## NEW COUNTRIES AND WORLD POLITICS

*Iba Der Thiam*, coordinator

# INTRODUCTION

*Iba Der Thiam*

The twentieth century has been marked by a series of events, deeds and changes whose scale, scope and consequences will surely be considered impressive by any standards. Not only did the first half of the century witness two world wars – with the resulting lost lives, physical destruction, psychological trauma and moral damage – in which humankind reached an unprecedented degree of barbarity (poison gas, the Holocaust, nuclear bombs on Hiroshima and Nagasaki), it also saw the world's first communist regime, whose birth was symbolized by the 1917 October Revolution and followed by a worldwide communist movement culminating not only in the triumph of Marxism-Leninism in China after the war against the Kuomintang and the Long March of Mao Zedong, but also in the New Deal in America and the Popular Front in France. The period was also marked by the roaring twenties, the beginnings of radio broadcasting, advances in motor and aircraft design, a proliferation of the press, the vote for women and progress, exemplified by the creation of the League of Nations and the building of a world order founded on peace, security, democracy, and justice – all of which fostered the rise of nationalism in the Arab, Asian and Latin American countries.

The impact of these changes would inevitably affect science, technology, education, culture, lifestyles and values. In the course of this period, after the years of economic recovery immediately following the First World War and the empire-building projects launched by the colonial powers, the world moved into a phase of deep economic depression resulting in widespread bankruptcy, unemployment, the development of Fascism in Italy, Nazism in Germany, militarism in Japan, and nationalism in the Middle East, Asia and Africa.

From this general climate arose some of the most potent causes of the Second World War; and the deeds and consequences of that war weighed so heavily on the course of events in every way that they radically transformed the existing order and marked a clear break with the past. Although the birth of the United Nations Organization (UN), the Universal Declaration of Human Rights, the Bretton Woods institutions, the Marshall Plan, the Brazzaville and Bandung conferences, Indian independence,

and the birth of the Federal Republic of Yugoslavia and the Non-Aligned Movement all represent undeniable and significant advances, progress was curtailed by the division of the world into the two blocs of East and West and the ensuing Cold War, the Berlin Blockade, wars in Korea and Indochina, the armed national liberation movements in Asia and the Arab world, the institution of apartheid, the Thiaroye Massacre in Senegal, and the incidents with French colonial power in Dimbokro and Seguela in West Africa, the Mau-Mau Insurrection in Kenya, and the Algerian War of Independence.

The tensions of this new phase were to prove all the harder to manage as ideas travelled faster with innovations in communication (radio, television, press). Science was making unprecedented strides: the conquest of space; progress in medicine, biology, physics and chemistry; a revolution in land, sea and air transport; improvements in living standards (televisions, refrigerators, automobiles); and the flourishing of the consumer society.

Agriculture, industry, the arts and crafts, literature, music, records, cinema, sports, leisure, work, social life, and urban development all underwent changes of an extraordinary scope and variety, radically altering practices, traditions, customs, the way people thought and behaved, and their aspirations and expectations. The arrival of the new independent African states on the international scene upset the existing international order and brought new challenges to the relationship between North and South: unequal exchanges, unfavourable terms of trade, debt, poverty, and demands for a new, fairer international economic order, the democratization of international relations, a new world information and communication order, and the creation of mechanisms to regulate trade, commerce, and tariffs (e.g., GATT).

Under the impact of successive oil shocks related to conflicts in the Middle East, the world crisis that followed the rise in the price of crude oil, American interest-rate policies, and erratic swings in the value of the international currencies, the economies of the poorer countries, which had experienced a euphoric growth phase in the 1960s, began to show signs of weakness by the late 1970s and were finally overwhelmed by the burden of their debts and forced

to adopt structural adjustment plans whose social consequences were dreadful.

The 1980s have come to be regarded as a lost decade, especially for Africa where growth ebbed and outright poverty increased. All macro-economic indicators showed downward trends: education, health, and employment underwent deep and lasting structural crises.

It was not until the fall of the Berlin Wall, the end of the world communist movement, and the absolute supremacy of the United States that new energies were released by a new world order based on market economics and pluralism in democratic government and in the media. Nationalism, terrorism, and tribal, ethnic, and religious wars erupted within national borders; and as the world entered the twenty-first century, it began a new stage of fundamental rearrangement. In the field of science, the information revolution, progress in the conquest of space, advances in medicine and genetics, and increasing concerns about the environment (ozone layer, inadequate water resources) have opened up new fields of research and activity. International relations have become more and more unbalanced, and the North has increased its technological, scientific and economic lead over the South.

Although new centres of growth have appeared in Asia, new states are emerging in Latin America, and Africa has experienced growth again in the 1990s, these signs are still too fragile for us to claim they constitute a strong or lasting trend as revealed by the Mexican crisis and the Asian stock-market crisis.

# 7.1
## RELATIONS BETWEEN INDUSTRIALIZED AND INDUSTRIALIZING COUNTRIES

*Nodari A. Simonia*

Among the most urgent tasks facing Asian, African and Latin American countries after independence were achieving economic independence and becoming integral and equal participants in the world economy. However, attaining these objectives proved to be a rather long, difficult and uneven process. A wide range of exceptions to free-trade principles were agreed upon between the old colonial powers and the newly independent countries, but this favoured treatment and the high hopes it generated were gradually eroded as illustrated by the Lomé Convention, a partnership between 70 ACP (African, Caribbean and Pacific) countries and the European Union. The most important aspect of the Lomé 'aid and trade' pillar was the provision for preferential access to European markets for ACP exports. Despite this advantage, most ACP countries have not be able to make progress in economic terms, and their market share actually declined from 6.7 per cent in 1976 to 3.4 per cent in 1993.

Within the framework of the confrontation between two systems (and two superpowers), the majority of developing countries chose to join the Non-Aligned Movement to resolve their problems of political sovereignty and achieve self-sustaining economies. Many countries went through a stage of 'revolutionary romanticism' hoping that radical political action could solve economic problems and create a 'New World Economic Order'. This phase was characterized by import-substitution strategies, as well as outbreaks of isolationism in some parts of the Third World. Although a number of 'oil shocks' in the 1970s and the early 1980s marked significant achievements in this struggle, they also revealed the limits of such successes and an undeniable interdependence between industrial and developing countries. Since then, a succession of challenges – debt shocks, threats to the world financial system – has reinforced our awareness that the welfare of all countries, whatever their level of development, is evermore closely interlinked. However, this interdependence was asymmetrical, and in essence, remains so since developing countries are more dependent than industrial countries.

Since the 1980s, there has been a serious shift towards pragmatism in the economic strategies of developing countries, which have considerably intensified since the end of the Cold War. The adoption of market-based, export-oriented economic development strategies by a wide range of developing countries represents a fundamental shift in their thinking about development and about the basis for participating in the world economy. The commitment of an even wider range of countries (including not only Eastern and Central Europe, Russia and the other former Soviet Republics, but also the more dynamic Asian and Latin American economies) to full participation in the global economy, and the impact of this globalization, will bring new opportunities and new relationships to the international division of labour.

In the 1990s, the developing countries registered a noticeably higher economic growth rate (6 per cent in 1995) than the industrial ones; and their exports and imports grew faster than world trade as a whole. Yet, there were growing disparities both within and among these countries. What appeared to be a relatively homogeneous Third World in the early 1960s is now a highly diverse group of countries and regions. Some developing countries are now achieving considerable rates of growth and impressive reductions in poverty; many have advanced so rapidly during recent decades that they are on the point of 'graduating' to the ranks of high-income industrial countries. While the majority of developing countries have grown more slowly, they have still done well compared with developed countries at a similar stage in their growth, and their standards of living have greatly improved.

In Asia, particularly, the emergence of China and India onto world capital markets has been a major new factor. Once again, their development has been based on a commitment to outward-looking, market-oriented policies, and on the prospects investors now see in these potentially giant economies. Both economies have enormous resources of human capital, but they also have large groups of people living in poverty or sub-standard conditions, and they face major social and environmental challenges.

Other developing countries have been increasingly marginalized from the global system and suffer continuing deterioration in already deplorable living standards: they include much of sub-Saharan Africa and certain countries in Latin America and South Asia. For many years, these

poorer countries will continue to be dependent on aid, reproducing dangerous patterns of aid dependency. In 1965, the average per capita income in sub-Saharan Africa was 60 per cent of the average in developing countries. By the late 1990s, the figure was less than 35 per cent, despite the many high-profile efforts launched repeatedly since the 1960s to support African development.

Tremendous changes have taken place in the geopolitical scene since the collapse of the Berlin Wall in 1989: the disintegration of the USSR and of the former Yugoslavia, ethnic strife in these territories, widespread suffering and dislocation of populations have made it evident that ethnic violence, a need for humanitarian relief, and formidable challenges of reconciliation and reconstruction are by no means confined to the developing world. Today, there remain significant challenges such as more comprehensive reforms, the maintenance of stability, and the reform of institutions and behaviour in Eastern and Central Europe and in the Commonwealth of Independent States (CIS). So far, only the 'fast-track' reforming Central European and Baltic States have reached – or almost reached – the steady 4 to 6 per cent annual growth needed to reduce the gap in living standards that separates them from other industrial countries. Only Poland has recovered its pre-1989 gross output levels. In the Central Asian republics of the former Soviet Union, now regarded as belonging to the group of developing countries, the Soviet-era economic and political system has created a legacy of serious environmental problems that will not be quickly or easily rectified and will adversely affect future development and public health.

## INTERDEPENDENCE AND INTERNATIONAL COOPERATION

### Official Development Aid (ODA)

Development is not an isolated objective, and development cooperation through financial and technical assistance is only one of many factors that substantially affect relations between developed and developing countries and that may significantly improve the economic, institutional and human development capacities of the latter group. Cooperation within the United Nations, the international financial institutions, the OECD (Organisation for Economic Co-operation and Development) and other global and regional organizations has greatly enhanced these efforts and shaped an evolving multilateralism in which all countries hold a vital stake. In those countries where aid has coincided with an adequate, constructive national strategy for development, the impact on growth has been positive. Overall, however, foreign aid to developing countries since 1970 has had no net impact on either the recipients' growth rate or the quality of their economic policies, according to an internal World Bank study (*Financial Times*, 14 April 1997). Positive reform has largely been the result of domestic forces.

Clearly, the shared objective of human security, combined with respect and concern for others, has not yet brought sustainable development to a position of central importance on the international agenda. Budgets have been much tighter in the donor countries, resulting in many cases in cuts in appropriations for development assistance. The end of the Cold War has removed the traditional security

rationale for development cooperation. Increased opportunities for productive collaboration have been threatened by a reduced sense of urgency manifested by a diminished political commitment and related financial resources. The so-called 'peace dividend' has not materialized.

Of course, there is no guarantee that state intervention will benefit society. Some developing countries do not meet even the most basic requirements for sound economic management. The major obstacles to development are arbitrary government action, bureaucratic corruption (bribes, abuse of patronage, etc.) and inefficiency. Some developing countries still lack the most basic underpinnings of a professional, rule-based bureaucracy, and the opportunities for sinecures and corruption are considerable. According to a large-scale survey, the *World Development Report* prepared by the World Bank in 1997, almost 80 per cent of entrepreneurs in Latin America, sub-Saharan Africa, the CIS, and Eastern and Central Europe reported a lack of confidence in the authorities' readiness or capacity to protect their persons or property. Another survey confirmed that corruption remains a widespread problem for investors. A corrupt bureaucracy that is allowed too much discretion creates incentives that divert capital towards *rentier* investments rather than productive activity. Overall, problems associated with uncertain property rights and dealing with arbitrary power (corruption and crime) rank among the top three obstacles in developing countries and emerging market economies.

Recent years have witnessed a growing convergence in thinking about the new rationale and objectives for development cooperation. The emerging framework for this cooperation is that development partners should try to help countries improve their capacity to participate in the global economy and should assist people in improving their capacity to overcome poverty and to participate fully in their societies. In 1996, the Development Ministers and Heads of Aid Agencies of the OECD's Development Assistance Committee (DAC) decided to consolidate this broad conceptual agreement. They adopted a new strategy for the twenty-first century that included a bold proposal for global partnership for locally owned, people-centred sustainable development. However, effective implementation proved to be fraught with obstacles. After remaining at around 0.35 per cent of DAC members' GNP for well over 20 years, DAC countries' collective ODA effort has fallen to just 0.27 per cent, its lowest level since the United Nations adopted a 0.7 per cent target in 1970. In 1995, only Denmark, the Netherlands, Norway and Sweden achieved the United Nations goal, and only Denmark and Japan had increased their ODA expenditure since 1992. Between 1992 and 1995, net ODA fell by 14 per cent in real terms – the sharpest three-year drop since the early 1970s.

### Private financial flows

In the mid-1990s, the overall picture of financial flows to developing countries was radically transformed: private flows to the larger and more dynamic economies began growing most rapidly, while the volume of official flows to the smaller and poorer countries – the ones most in need of financial aid if they are to attain the capacity for sustainable development – is declining. These diverging trends cast a

shadow on the credibility of a development partnership strategy and their continuation could have grave consequences.

Measured in constant dollars, total net flows of ODA received by developing countries have remained stable in the range of US$55–60 billion since 1986. In current dollars, ODA increased from US$56.7 billion in 1987 to US$69.4 billion in 1995, but as a percentage of the total net flow of resources to developing countries, ODA declined over the same period from 66.1 per cent to 28.3 per cent, while private flows increased from US$30.7 billion (35.8 per cent) to US$158.9 billion (67.4 per cent). Net private capital flows increased in 1996 for the sixth year running, surging to a record US$243.8 billion; but most of the money bypassed the poorest countries. These private flows are highly concentrated: among the top twelve destinations for private capital were four from East Asia (China, Malaysia, Indonesia, Thailand) and four from Latin America (Mexico, Brazil, Argentina, Chile). The top twelve recipients together accounted for 72.5 per cent of overall private inflows. No wonder, then, that the World Bank recently admitted (*Annual Global Development: Financial Report*, March 1997) that private capital is not a substitute for ODA targeted at programmes aimed at promoting health, education and environmental protection.

### Non-governmental organizations (NGOs)

In some developing countries, especially in Africa, one of the major changes has been the recognition that in development issues the state does not have to be the donor agencies' only interlocutor. However, if a strengthening of capacities does not support the decentralization which is flowering in many Third World countries, it will soon perish. NGOs from developing and industrialized countries can play a key role in this process. In general, NGOs are flexible and efficient; they work at grass-roots level and are familiar with the needs of local populations. They may help to set and monitor standards and inform the world community of social or environmental damage. There is general agreement that NGOs must play larger and more prominent roles in education: they can be of assistance as advocates, sources of funding, intermediaries for managing assistance, and local programme implementers. Many of the most responsive local organizations and programme initiatives have features promoting health, nutrition, or other benefits in addition to educational ones. Programmes initiated or managed by NGOs appear to have significant advantages, both in their responsiveness to local needs and in reduced administration and other overhead costs. One major development is the growing maturity of developing countries' own NGOs, which tend to play a more important role in articulating the needs of the poor in their communities.

NGOs have emerged as prominent partners in the development field. By the early 1980s, virtually all DAC members had adopted some system for co-financing projects implemented by their national NGOs. Net grants by NGOs (net disbursements, at current prices and exchange rates) have risen from US$2.39 million (3 per cent of total financial inflows) in 1980 to US$5.97 million (4 per cent) in 1999. However, some NGOs feel that they are being used only as cheap delivery systems. Rather than simply filling gaps, they want to sit at the table. In its capacity as Secretariat of the Committee of International Development Institutions on the Environment, UNEP (the United Nations Environment Programme) provides a link between the DAC Working Party and most major international organizations concerned with environmental matters. In addition, three international NGOs – the International Institute for Environment and Development (London), the International Union for Conservation of Nature (Gland, Switzerland), and the World Resources Institute (Washington, DC) – have been invited to participate regularly as observers.

### 'NEGATIVE INTERDEPENDENCE': GLOBAL PROBLEMS

Along with the increasing trend towards economic interdependence and integration, the world community is confronted by the challenge of growing 'negative interdependence' caused by various global problems threatening developed and developing countries alike. Problems related to the quality of water, soil and air; acid rain; climate change caused by the greenhouse effect; loss of biodiversity; depletion of fish stocks; current patterns of production and consumption – all raise questions about the future capacity of the Earth's natural resource base to feed and sustain a growing and increasingly urbanized population. Industrial countries increasingly recognize that the solution to such problems is no longer solely in their hands and that the management of global issues in the twenty-first century will require the active participation of all members of the international community.

### Energy problems

Availability of sufficient low-cost energy is indispensable for growth in developing countries as well as in industrialized countries. Reconciling the energy needs of different groups of countries may generate particularly difficult policy challenges in the very near future. Fossil fuels now account for 80 per cent of the world's drastically increased energy consumption. The geographical distribution of energy sources is very uneven. In 1995, OPEC countries possessed 778.2 billion barrels of known oil reserves; 103.9 billion barrels were in the OECD group, 57 billion in the territory of the former Soviet Union and 77.8 billion in other countries. On the demand side, OECD countries consumed 50 per cent of world energy in 1986, all developing countries 27 per cent, and the centrally planned economies 23 per cent.

Two acute problems are already evident today: (1) demand is growing faster than expected; and (2) the centre of gravity of the world's oil markets is shifting rapidly eastwards, to the fast-growing economies of China and South-East Asia. Recent studies indicate that every Asian country except Brunei will be a net oil importer by 2015. (China, one of the biggest energy consumers in Asia, has recently turned the corner and become a net oil-importing county). In India, another major energy-consuming country, economists estimate that power shortages cost Indian industries US$2.7 billion annually, equivalent to 1.5 per cent of the country's GDP.

A crucial issue for developing countries is the future of nuclear power, which may conceivably become a major

supplier of energy. Today, Argentina, Brazil, India, Pakistan and South Korea already have nuclear capacity, which accounts for a significant part of their electricity production. However, this subject raises an important question: Can energy sufficiency be achieved safely, without environmental contamination and without the danger of nuclear war or nuclear terrorism? Some experts argue that 70 years will be needed before the Chernobyl 'tomb' is safe. In any case, wind, solar, tidal energy and other clean and safe alternative sources must be seriously considered.

## Ecology

There is growing concern about a number of global-scale types of environmental degradation. The build-up of greenhouse gases creating a one-way thermal barrier with the risk of global climate change is one of the most serious potential threats. It is largely related to the use of fossil fuels. As a result, carbon dioxide concentrations in the air have increased by some 30 per cent over the past two centuries, and the average temperature has risen by 0.3–6 °C over the past century. Industrial countries have been a major source of greenhouse gases: in 1985, OECD countries were responsible for approximately 46 per cent of global carbon dioxide emissions (North America accounts for 25 per cent, Europe 15 per cent, Japan and the Pacific region 6 per cent). The centrally planned economies' share was 26 per cent, and that of all developing countries together was 27 per cent. Despite the work accomplished at the Earth Summit in Rio de Janeiro in 1992, the treaties to protect the atmosphere were still foundering by the end of the century, and annual emissions of carbon dioxide from fossil fuels have climbed to an all-time high, altering the very composition of the atmosphere.

Developing countries are also concerned by this situation, both as sources of global environmental degradation and as potential victims. According to a World Watch Institute report (January 1997), the United States' share of world carbon emissions today is 23 per cent. China comes second with 13 per cent, Russia produces 7 per cent, Japan 5 per cent, Germany and India 4 per cent each, and Indonesia and Brazil each generate 1 per cent.

Tree felling and burning, and deforestation in general, are other sources of carbon dioxide emissions. Burning forests produces carbon dioxide as a one-off effect, but in addition the burned forests stop absorbing carbon dioxide and acting as 'lungs' for the Earth. According to an FAO study (March 1997), our planet lost an average of 15.5 million hectares of forest each year between 1980 and 1990. Only 20 per cent of the world's major virgin forests remain, almost all in the far north of Russia and Canada, and in Brazil's Amazon region (World Resources Institute, March 1997). Another negative result of deforestation is desertification, which has reached disaster proportions in Africa.

Major national and international actions and initiatives have been launched to address global environmental issues. The United Nations Environment Programme, together with other international institutions, has an important role to play in organizing action in this field. UNEP coordinates the United Nations Plan of Action to Combat Desertification: the countries of the Sahel have elaborate plans forming a framework for these actions. In an effort to protect the ozone layer, whose depletion is causing serious health hazards (skin cancer and eye diseases), the Montreal Protocol of 1987 was strengthened in May 1989 by an agreement, supported by 80 countries at the Helsinki UNEP Conference, to end all production and consumption of CFCs by the year 2000. The 1992 Rio Summit gave momentum to consideration of the problem of the global environment in all its complexity and provided an opportunity to review the many initiatives already undertaken as part of a global strategy. Under a Climate Change Convention adopted at the Rio Summit, developed countries were to reduce their greenhouse gas emissions to 1990 levels by 2000. To avoid a loophole in this convention, a crucial conference held at Kyoto (Japan) in December 1997 set legally binding targets for industrialized countries to cut their emissions of these gases after 2000. However, the effectiveness of the Kyoto Protocol was seriously undermined when United States President George W. Bush refused to sign the agreement in 2001.

In the case of the developing countries, it is generally recognized that uniform environmental standards may not be practical, economical, or politically viable for many of them. Agenda 21, the comprehensive plan of action adopted at the Rio Summit recognized that environmental standards valid for developed countries might bring unwarranted social and economic consequences in the developing world. The North should do more to help the South in using environmentally sound technologies, practices, and products, for example those that incorporate energy efficiency and pollution-control criteria. Developed countries could make a great contribution through cooperation and partnership with developing countries in the field of environment-friendly technology. Environmentally sustainable ODA must become the norm.

## The population explosion

In many developing countries, combating poverty and solving environmental problems are made more difficult by continuingly rapid population growth. In some cases, population growth rates are too high to permit sustainable development. It is estimated that population growth in the developing countries will account for virtually all the increase in the world's population from 5 billion in 1990 to about 7.5 billion in 2015. This increase over 25 years is roughly equal to the total human population in 1950. The population explosion is therefore one of the enormous challenges to be faced by the developing countries: the prospect carries severe economic, environmental, social, and political implications. Many developing countries will have tremendous problems coping with the doubling or even tripling of their populations over the next few decades. Acute situations are projected in sub-Saharan Africa, where population growth will be greatest and the capacity to cope is weakest. Most Islamic countries face a population explosion, which will greatly exacerbate the challenges of political and economic modernization. The population of India is projected to increase by over 600 million by 2025 (to 1.45 billion), while Pakistan and Bangladesh could more than double in size to well over 250 million each. Even advanced developing countries such as Brazil and Mexico face the task of absorbing huge population increases, and an increasing number of mega-cities are appearing in all parts

of the developing world, with their attendant social, political, and environmental challenges (Plate 49).

In its early years, 'development' was discussed and planned with little reference to demographic factors. At the 1974 World Population Conference in Bucharest, the world community first acknowledged the determinant role of population factors in development and the need to curb population growth rates. According to WHO estimates in the late 1980s, about 300 million couples who did not want more children were not using any method of birth control. As discussions at the Rio Summit underlined, any delay in adopting appropriate population policies will exacerbate the situation. The 1994 Cairo Conference on Population and Development resulted in effective action towards making voluntary family planning available to more couples.

Along with high population growth in the poorer countries come rapid urbanization and increased pressures on soil, water, forests, and air. These pressures are evident in all regions, but their specific manifestations vary, as do the capacities of countries and regions to cope. These negative tendencies are also reflected in the growing problem of international migration: as wealthy countries around the world face a growing influx of illegal immigrants and refugees, many are turning to military force to stem the flow.

### Water supplies

According to United Nations reports (March 1997), water shortages – which currently affect about 40 per cent of the world's population – will become increasingly frequent in the twenty-first century and can be expected to reach crisis proportions by about 2030, due to a combination of population growth and pollution. Today, some 80 countries experience serious shortages. About one-fifth of the world's population has no access to safe drinking water, and approximately one out of every two people lacks adequate sanitation. Even in relatively wealthy Europe, there are some 110 million people without access to safe drinking water. Water-borne diseases that had been considered eradicated, such as cholera, have reappeared in some former Soviet republics. The Aral Sea in Central Asia – once the world's fourth largest lake – is shrinking: four decades ago, about 60 cubic km of fresh water flowed into the Aral every year; now only 1–5 cubic km trickles through annually, depending on the rainfall. Experts describe water supplies as one of the main challenges of the twenty-first century, a view echoed by the World Water Council, which organized the World Water Forums attended by scientists, bankers, United Nations and other officials from five continents. Speaking at the First World Water Forum in Marrakech (Morocco) in 1997, UNESCO's Director-General, Federico Mayor, said: 'To provide for foreseeable future needs, water resource development and management must be placed at the top of national and international agendas as part of a global strategy'.

With some 300 major river basins extending across national boundaries, future conflicts over their water constitute a serious potential risk. Some United Nations officials believe that over the next 50 years water could replace oil as a principal cause of major conflicts between countries and peoples. Indeed, as water supply emerges as a key factor in many regions of the world, it is becoming an increasingly prominent political issue. In North Africa, where urbanization is drawing most of the population to the coastal regions, and in the Middle East, where competition is intensifying for what is mainly a single, interconnected water system, water is the key resource issue and is fast becoming a crucial point on the region's political agenda. Water can therefore either become a cause of conflict or a catalyst for regional economic and political cooperation.

### OBSTACLES TO THE SEARCH FOR A NEW WORLD ORDER

Now that the Cold War is over, confusion seems to reign concerning what happens next in the new millennium. The world is clearly in transition since the collapse of the Berlin Wall, but the following question inevitably arises: how might the fabric of the world economy be woven in new ways? Too many in the West assume that the answer lies in the ongoing process of globalization: they believe that economic globalization is inevitable and that nothing can be done to shape its social consequences. On the basis of these assumptions, they insist that developing countries must dismantle their protectionist barriers to accelerate liberalization and allow foreign institutions to compete more freely for business within their borders. They assume that globalization of the economy is leading to increased wealth; but that is only one side of the story. The other side is that we are now witnessing greater divisions and inequalities within and between societies, accompanied by uncertainty and even scepticism about the present models of international cooperation. Today the 350 wealthiest moguls have as much money as the poorest 3 billion people. The UNDP 1996 Human Development Report from the notes that the poorest fifth of the world's population saw its share of global income decline from 2.3 per cent to 1.4 per cent in the past 30 years, while the share of the richest fifth rose from 70 per cent to 85 per cent. So, the following question arises: does globalization hold the best answer to the problems arising from the process of transition to the new world economic and social order?

### Globalization

It is undeniable that globalization can lead to numerous economic and scientific achievements. But even in some highly developed Western countries, there is unease and anxiety that the economic and cultural price of globalization may be too high. The most painful dilemma involves the manner in which their national identity can be protected. In the case of most developing countries, globalization has been met with fiercer resistance because it puts much more severe pressure on local institutions and traditions in their societies. While it has been generally acknowledged that globalization has had a certain positive impact on some developing countries, especially advanced ones, certain aspects must be viewed with alarm. The developing countries generally are conscious of being at the receiving end of globalization. They are concerned that it may become a Western-dominated process and dilute efforts towards nation-state building – a process that most developing countries have not yet completed. It is also

feared that globalization may prove incompatible with efforts to strengthen regional groupings, which has proven very useful for small countries. Furthermore, it cannot be denied that there are certain sectors of society and certain countries that have been marginalized: this was acknowledged in the final communiqué of the G-7 Economic Summit in 1996. Given the swift pace of globalization and the speed with which products and markets now evolve, countries and groups that are slow to integrate will find it increasingly difficult to catch up with the rest of the industrialized world, and so globalization clearly involves a risk that entire countries and regions may be left behind. Kofi Annan, Secretary-General of the United Nations, speaking in February 1997, at the World Economic Forum in Davos said: 'Globalization in itself cannot be seen as a magical panacea. The benefits of globalization are not always apparent to the poor, the hungry and the illiterate.'

Even the newly emerging and rapidly developing countries are worried in the face of evidence that Western industry is primarily focused on gaining better access to high-flying economies in Asia and Latin America, and although these countries have lowered barriers to imports and foreign investment in manufacturing and infrastructure, they have been much more reluctant to liberalize their financial services. Even some countries that accept the economic case for liberalization are unwilling to be seen to yield to external pressure – all the more so when much of it is generated by powerful foreign institutions eager to muscle in on their markets. Furthermore, some developing countries are asking why they should go along with a deal that offers them no advantages in terms of their exports. They doubt that the major industrialized countries are really willing to fully open their markets to the exports of the developing world, as required of members of the World Trade Organization. Is business in the developed countries really prepared to accept the structural changes brought by liberalization? It is clear, then, that there are many sensitive questions connected with globalization, and their answers will determine the nature and quality of society in the twenty-first century.

## The World Trade Organization (WTO)

The Uruguay Round of trade negotiations (1986–94) involved a difficult struggle to balance different interests across a wide range of issues. Its successful completion and the creation of the World Trade Organization (WTO) in 1995 marked another important step towards launching a 'New World Order' in trade. While the WTO has inherited many characteristics from the General Agreement on Tariffs and Trade (GATT), it also features some innovations. Unlike GATT, the WTO was set up as a permanent international agency with a reinforced capability for handling trade disputes. The WTO's dispute-resolution mechanism has been strengthened so that the process can be triggered automatically, and no country, however big, can veto adverse rulings. Since WTO began its work in 1995, internationally agreed regulations have been extended for the first time to agriculture, trade in services, textiles, and the protection of patents, copyright and trademarks. The WTO now provides a multilateral forum for negotiations on these vitally important sectors of global

commerce, and its existence has fundamentally altered the way in which countries address their concerns about the practices of their trading partners. Developing countries have been among the most active in shaping these new norms for expanding trade: their participation in global negotiations and the market-opening reforms that many are adopting have given them new international influence and a new stake in a functioning world economic system.

The creation of the WTO is hardly an end in itself, but only the beginning of a long and controversial process. At present, the WTO needs to make real progress in setting clear priorities for the global trading system. Developing and developed countries try to set different agendas and priorities. The difficulty in striking the right balance is highlighted by the unresolved controversy over proposals to extend the WTO's role well beyond the assault on trade barriers at national borders to include the harmonization of domestic regulatory policies. Such controversies surfaced during the WTO Conference in Singapore (December 1996), attended by 128 member states and 30 observers. The WTO's twin concerns – free trade and sustainable development – had given rise to disagreement on how to strike the proper balance between them. Although industrialized and developing countries shared the view that cross-border investment is a vital source of future economic growth, the two sides remained far apart over the drafting of rules to promote such investment. There were also fierce disputes over human rights and the extension of standards for labour protection. Opposition to these reforms was led by Indonesia, Malaysia, Egypt, Tanzania, Brazil, India and Pakistan. Developing countries consider these Western proposals a thinly veiled form of protectionism, fearing that such proposals, if accepted, would undermine their main comparative advantage in world trade: cheap labour. They argue that their economies – and their workers – would be worse off under such rules.

Of course, the tug-of-war over the WTO's future direction is due in large measure to its membership, which includes developing countries and already-developed ones with different national policies. Nevertheless, there is an extremely pressing need to halt the international frictions that arise from the spread of industrialization and its technical advances. A certain degree of protectionism for developing countries during the takeoff period is inevitable and justifiable, for similar measures were once widely resorted to by today's developed countries in the early stages of their own process of industrialization. Efforts should be made, therefore, to build a liberal economic order that makes possible the coexistence of different types of market economies. This is admittedly a formidable task, but the alternative is trade wars.

## The new world order in information and communication

With the invention of transistors in the 1940s, the modern era of solid-state electronics was born, thus paving the way for our portable radios and phones, pocket calculators, computers, CD players and a plethora of other handy gadgets that we now take for granted in the Information Age. In the past, a country's competitiveness was determined primarily by the productivity of its industries. But in this era of computer networks and advanced information

technology, national competitiveness will be decided by easy access to high-quality information. The accelerating trend towards a more integrated, competitive and interdependent global economy is receiving further impetus from a veritable revolution in the efficiency of communication, i.e., the spreading of information and technology at progressively lower cost and greater speed. At the beginning of the twentieth-first century, an information revolution is in progress, prompted mainly by computer technology and genetic engineering – the so-called third Industrial Revolution. Even an advanced industrial country can be driven into an inferior position within a short time if it allows its technological inventiveness to fall seriously behind. Computer-controlled production and processing will inevitably, by its wide diffusion and ever-advancing technology, bind more and more countries into close relationship. As a result of new developments in information processing, communications, and transport, there has been a progressive expansion and intensification of mobility and knowledge and, with these, a greater mutual economic penetration among countries.

One of the results of the information revolution is that we now have the means of knowing far more about people in other countries. Of course, the number of people who make active use of the information revolution is still fairly limited. Like the new forces of global economics, the globalization of knowledge is geographically restricted, and even the simpler benefits are not available in many parts of the Third World. Two-thirds of the world's population has never made a phone call, and about one out of every two persons has no access to a telephone. In October 1996, International Data Corp. (United States) compiled an 'Information Imperative Index', intended to rank countries by their ability to access, absorb and effectively take advantage of information and information technology. According to this document, the top 20 include the United States, Sweden, Australia, Canada, New Zealand, the United Kingdom, Denmark, Finland, Germany, Singapore, Japan and France. South Korea ranks 22 and China and India between 45 and 50.

Of course there are some encouraging signs. For example, doctors in 23 African countries use the Internet to obtain assistance in diagnosing and treating patients by applying directly to colleagues at some of the best medical centres in the world for advice. There are computer programmers in India working for large United States corporations, writing programs and sending their work via the Internet. Yet in many parts of the developing countries, the Internet – for those who have even heard of it – is still largely inaccessible. In the case of microelectronics and information technology, few noteworthy initiatives have been launched by research laboratories in OECD countries towards developing applications that would benefit developing countries – with perhaps one outstanding exception: in 1997 it was announced that four of the world's largest radio manufacturers would begin mass-producing a revolutionary new radio. This will be a hand-held portable radio capable of receiving hundreds of high-quality digital radio channels, text and even photographs broadcast by satellite. The specially designed radios are the chief element in an ambitious plan developed by Ethiopian-American Noah Samara to launch digital satellite radio services aimed at more than 4.6 billion people in the developing world. The first satellite, AfriStar, constructed by Alcatel of France,

was launched in the middle of 1998, followed by AsiaStar in 2000.

The future turned a little brighter in February 1997, when 68 members of the WTO agreed to lower telecommunications barriers. By opening these traditional state preserves to international competition, the agreement will radically restructure the global market. The developed countries will naturally get the lion's share of that market, but the agreement's benefits for the people of all countries are clear. Although many developing countries felt left out of the deliberations, they appeared to agree that a step forward had been achieved, if not the leap they had hoped for. It is estimated that if the new agreement promotes genuine competition, the cost of an international phone call could be cut by almost 80 per cent. Over the following decade, total savings to consumers are estimated at about US$1 trillion. All this could mean a telephone in every village, which for many could be a matter of life and death.

In March 1997, an agreement was reached to eliminate tariffs on some 200 information technology articles such as computers, chips, chip-making equipment, software and telecommunications equipment by January 2000. Developing countries have increasingly realized that they have more to lose than to gain by keeping their markets closed. Traditionally, these countries have been concerned about the threat to their own national operators from the large international carriers. They are aware, however, that they need US$60 billion annually simply to maintain their existing telecommunications services – and much more if they are to catch up with the more advanced countries. Foreign investment is the only way they can hope to find the capital. For the poorest countries, the two above-mentioned agreements offer an opportunity to use the 'latecomer's advantage', catching up with the rest of world by accelerating their development through more rapid and less costly implementation of new technologies such as cellular networks.

### Genetic engineering

It is clear that scientific research and technological innovation are essential for sustaining and accelerating development in Third World countries, but at present the countries' capacities for absorbing and applying modern science and technology are often very limited and require strengthening. While research and development (R&D) capacity in most developing countries is still underdeveloped and underfunded, OECD countries devote only a small fraction of their R&D efforts to problems that are specific to the Third World. Areas of R&D in which improved international cooperation would be desirable include biological research and biotechnology. More R&D should be directed towards improving production levels of crops in the Third World. A recent step in this direction was the establishment of the United Nations International Centre for Genetic Engineering and Biotechnology. The work of the Centre – carried out at its branches in Trieste, Italy, and in New Delhi, India – together with that of the CGIAR research network (Consultative Group on International Agricultural Research) will benefit agriculture and health in developing countries.

Biotechnology in OECD countries has experienced 'explosive growth' over recent years. By the end of 1996,

Europe alone had 716 entrepreneurial biotech companies, employing 27,500 people. Research in biotechnology has already produced some outstanding successes: discovering a way to modify a cell's identity by reprogramming its genes is an achievement with tremendous scientific and medical implications. Just recently, scientists genetically engineered bacteria that may one day prevent kissing bugs from spreading Chagas disease, which has infected about 18 million people in Latin America and kills 45,000 annually. The importance of biotechnology for solving food problems cannot be overestimated. Today in OECD countries, a burgeoning industry produces a variety of genetically modified food. There are grounds for hoping that in some not-so-distant future genetic engineering will allow developing countries to breed super-productive livestock – cows that can produce five or ten times the normal amount of milk, or larger chickens, pigs or fish – and plants that grow faster or are especially hardy or disease-resistant.

Scientists also hope to breed animals with special characteristics, such as organs that will not be rejected by immune systems when transplanted into humans. The successful animal-cloning experiment carried out in 1996 ('Dolly' the sheep) (Plate 50) constitutes another milestone in science, but it also reminds us once again that our reach continues to exceed our grasp. The ultimate effect on humanity of endless technological innovation has not yet been fully understood. Having succeeded in artificially producing materials that do not exist in the natural world, the human species is on the verge of entering a yet-unknown realm: the creation of new life forms. In many OECD countries today, there is consumer concern over possible side effects (nutritional, toxic or allergenic) of artificially introducing genes in food products. But these concerns, while perfectly legitimate, appear less critical when compared with the immense ethical and moral issues raised by the prospect of human cloning.

# 7.2
## AFRICA AND THE NEW INTERNATIONAL ECONOMIC ORDER

*Edmond Kwam Kouassi*

'One of the most complex problems facing humanity today is that of development, defined as a process involving the dynamic and cumulative liberation as well as transformation of the mental, political, economic, cultural and social structures of any human group according to their particular values and pace.'[1]

Thus, the political and economic aspects of the relations between rich and poor countries have, for a long time, remained at the core of international debates. During the colonial period, the relations between the colonizing 'North' and the territories of the 'South' were often of the sovereign-to-subjects, 'horseman and horse', 'fox in the henhouse' variety. However, since gaining political independence, the countries of the South fostered more complex and ambiguous relations with the countries of the North. With the advent of a new era – namely that of bargaining and negotiation – one could no longer speak of the balance of 'forces' of 'subjection.' In most cases, the respective negotiation positions of the North and the South are fundamentally asymmetrical given that, in general, the states of the North are significantly more powerful than their partners of the South. Generally, the North-South bargain concurrently involves a number of problems that not only complicate the negotiations but also provide them with greater substance.

During the 1950s and 1960s, most North-South meetings had taken place under the aegis of the political independence of the former colonized countries since the focus was put on the standard issues of 'security' and economic assistance. By the end of the 1960s, many realized that political independence only existed in the legal sense and that it had also failed to culminate in the economic growth and development expected by the leaders of liberation movements. It is for this reason that, towards the late 1960s and early 1970s, attention was focused on economic issues such as improved terms of trade, market access, lending conditions and monetary relations. These issues concerned all the countries of the South and particularly Africa, which, working through the Non-Aligned Movement, made a significant contribution towards urging the international community to address them.

The most striking development of this era was undoubtedly the United Nations Extraordinary Session on raw materials and development, which took place in 1974. Although the session did not pave the way for any general agreement between the industrial and developing countries, three important texts were adopted by consensus (i.e., without formal voting since consensus was defined at the Helsinki Conference on Security, Stability and Cooperation in Europe as 'the absence of an objection raised by a delegation, which can stall decision-making'): a declaration concerning the establishment of a new international economic order; a 'programme of action' to operationalize the principles of the declaration; and a special assistance programme to Third World countries facing severe economic crisis and natural disasters.[2] However, serious reservations expressed by the industrialized countries on a number of provisions in these texts, coupled with the attempt by the Group of 77, a coalition of over 100 countries, to have its proposed assistance programme adopted instead of the American proposal, showed that the ideological, economic and political gap between the rich and the poor countries had not yet been bridged.

Nonetheless, the session marked a serious turning point in international relations. In the context of the energy crisis, it conferred credibility to the political force and economic power of the developing countries. For the first time in the history of the United Nations, the General Assembly worked on the basis of documents prepared by Third World countries. The development problem, taken as a whole, and not solely the processing of raw materials, was highlighted at the highest international level by the concerned parties themselves. Considered one of the world's priorities by all the nations of the world for some twenty-five years, the development problem has in fact been exacerbated. The failure of the international development strategy has been acknowledged by all.

Algerian President Boumediene highlighted the problem with greater pertinence in his address to the General Assembly: 'The commodities markets – coupled with the virtual monopoly of manufactured and capital goods, and the monopoly over capital and services – enabled the developed countries to fix, in their own way, both the prices

of raw materials, which they procure from the developing countries, and the prices of the goods and services they deliver to the developing countries. Thus, they are in a position of obtaining for their own advantage the resources of the Third World countries through a multitude of channels'.[3] Indeed, according to the United Nations Conference on Trade and Development (UNCTAD), the market economy industrialized countries, which are four times less populated than the poor countries, consume nine-tenths of the total non-ferrous metals supplied, four-fifths of the world's oil and natural rubber production and half of all unprocessed cotton, vegetable oils and sugar. This consumption, which is sometimes wasteful, was spurred by the relatively low prices of these agricultural commodities.

This situation has persisted to the present day because the Third World does not have the necessary leverage in international affairs. The increased number of independent states, instead of leading to an equitable and commensurate involvement in the responsibilities of managing world affairs, has resulted in a greater concentration of decision-making powers in the hands of a closed circle of privileged powers, which wield virtually discretionary powers in handling major problems. The same applies to the international finance structures. In concrete terms, the issues at stake are a more equitable distribution of the fruits of economic growth, the bridging of the income gap, greater participation in responsibilities and dignity.

The proposed New International Economic Order thus aims at establishing a new system calling for not only 'the abolition of privileges' of the industrialized countries, but also an economic constitution that will guarantee the rights of the peoples of the Third World to establish a new type of international economic relations based on mutual benefit, complementarity and common development.

The demands of the developing world are intended to bring about a solidarity-driven, international-based, more harmonious community where the inhabitant of the Third World – the person wrongly seen by Professor Gonidec as having 'the eyes of a child and bare hands' – ceases to be the prey of the strong and the rich. The developing world looks forward to a responsible and balanced community in which it ceases to be the 'the child who lies prostrate beyond the light of History' as was wrongly claimed by Hegel in his ideas about the African continent.

Through a number of resolutions, declarations and action programmes, Third World countries have formulated strategies, development decades and model societies backed by a coherent ideology, thereby giving some meaning to the New International Economic Order. The central thrust of the New International Economic Order is to review existing structures in the fields of international economic relations to enable Third World countries to begin or accelerate an internal and relatively autonomous process of growth, diversification and integration. This process must be conducted in such a way as to ensure that Third World countries are in a position to deal efficiently with the looming internal crises affecting them today, namely, mass poverty, widespread unemployment and the glaring food deficit. The focus was placed on the means of providing the developing countries with increased net resource flows primarily through trade and assistance.

Other important issues involve the raw materials problem, the reform of the international monetary system and funding development in poor countries, industrialization,

technology transfer, the regulation and control of transnational corporations, and promoting cooperation among the developing countries

Since the main thrust of these texts concerns the redistribution of economic power on the world scale rather than the transfer of resources emanating from international assistance, the developing countries have set three objectives:

1. the effective control of wealth, natural resources and economic activity;
2. commercializing resources and activities at stable, equitable and remunerative prices;
3. establishing a common front for international negotiations.

Relying on the experience of OPEC (Organization of the Petroleum Exporting Countries) and working within the structures of the United Nations in which they would be assured a majority, they aimed to enable developing countries to exert a three-fold control over their products: control of ownership, control of the market, control of the group's solidarity by maintaining a common front. It is for this reason that Mario Bettati affirmed that the Third World's demands for a New Economic Order were formulated to achieve the following three objectives:

1. consolidating the economic sovereignty of developing countries;
2. searching for institutional changes in trade;
3. promoting endogenous development.

Africa has contributed extensively to the conception of such a programme. Nonetheless, its success depended on the reality and the consistency of the political will of the protagonists, and the cohesion of the entire group of developing countries.

## ORIGIN OF THE EXISTING INTERNATIONAL ECONOMIC ORDER

In describing the current world economic situation, strictly speaking it is inappropriate to refer to an international economic 'order' as what is referred to is more precisely an 'interaction' at the global level, which is the result of economic forces (and the actions of national powers) and of a particular historical situation.

During the nineteenth century and the first half of the twentieth century, a large number of countries now called 'developing' were in fact territories dependent on European powers. The latter determined the destiny of their territories and dictated the types of economic policy they should pursue and their role in international economic relations. During this period, those who lived under the tutelage of colonial powers did not enjoy full political and economic freedom. They had no control over their natural resources and did not receive equitable payment for their produce. This mode of economic and trade relations benefited only the colonial powers, and the dominated territories were given the minimum necessary to ensure the functioning of an administration compelled to impose the type of public order deemed suitable by the European countries.

The current economic order was therefore instituted at a time when the vast majority of developing countries were dependent territories. This economic order, which did not involve the active participation of these countries, is very unfavourable to them. It is generally accepted that economic

and monetary relations are based on three principles: freedom, equality and reciprocity. However, these principles cannot ensure general prosperity unless all the countries have equal resources. In the present world, where powerful states border poor and weak ones, they can only work to the advantage of the strong and to the detriment of the weak. Indeed, freedom favours exploitation, legal equality generates material inequality and reciprocity in concessions deepens the already wide gap between rich and poor countries.

One should therefore see in the existing order a veritable 'disorder'; one can refer to a new order only if any order had indeed ever existed, and this is not the case. The current order is a great obstacle to the enjoyment of the human rights and fundamental freedoms proclaimed in the Universal Declaration of Human Rights, particularly Article 25, according to which 'Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family'. The international economic order is unjust mainly because the developing countries were not involved in its establishment and must nevertheless endure all the consequences. It is therefore necessary to change the situation in the interest of the international community as a whole. The call for this change was inspired by a number of political and legal texts, which are analysed in the following section.

## ARGUMENTS FOR A NEW INTERNATIONAL ECONOMIC ORDER

In the quest for a new international economic order, there are two categories of arguments, namely, political and legal.

### The political argument and the declaration for the establishment of a new international economic order

In order to break out of the crisis besetting the international economy since 1973, it was necessary to embark on action at the international level. The opportunity was provided by the initiative of OPEC, which decided to increase oil prices on 16 October 1973.

On 31 January 1974, Boumediene, in his capacity as chairperson of the Non-Aligned Movement, requested that an Extraordinary United Nations General Assembly be convened to consider the issue of raw materials of the poor countries. Following the acceptance of this proposal, the United Nations General Assembly met from 9 April to 2 May in New York in an extraordinary session and adopted Resolution 3201 'Declaration concerning the establishment of a New International Economic Order' (NIEO). This declaration stated inter alia: 'We, the Members of the United Nations... Solemnly proclaim our united determination to work urgently for the establishment of a New International Economic Order based on equity, sovereign equality, interdependence, common interest and cooperation among all States, irrespective of their economic and social systems, which shall correct inequalities and redress existing injustices, make it possible to eliminate the widening gap between the developed and developing countries and ensure steadily accelerating economic and social development and peace and justice for present and future generations.'

The declaration condemns the current situation and sets out the principles that should govern the New International Economic Order. The highlights of this document, as set forth in the introductory paragraphs, are as follows:

- Point 5 presents the principle of full sovereignty of states over their natural resources and economic activities, the right to exercise effective control over them and their exploitation with means appropriate to their own situation including the right to nationalize or transfer ownership to its nationals. This article also stipulates that no state may be subject to any economic, political or any other type of coercion aimed at hampering the free and complete exercise of this inalienable right.
- Point 6 states that all states, territories and peoples under alien and colonial domination or apartheid shall be entitled to restitution and total compensation for the exploitation, reduction and degradation of the natural resources and any other resources of those states, territories and peoples.
- Point 10 calls for a just and fair relationship between the prices of raw materials, primary commodities, manufactured and semi-manufactured goods exported by developing countries and the prices of raw materials, primary commodities, manufactured goods, capital goods and equipment imported by developing countries with the aim of fostering sustained improvement in the terms of trade as well as the broadening of world economic cooperation.
- Point 17 states the need to put an end to the waste of natural resources including food products.
- Encouraging the creation of OPEC-model cartels, Point 20 recommends facilitating the role played by producers' associations in international cooperation, and, with a view to attaining their objectives inter alia, contributing towards the sustained growth of the international economy and accelerating the development of developing countries.

It is obvious that the operationalization of this declaration requires a legal basis.

### The legal basis of a new international economic order

Pursuant to the operationalization of the principles of the NIEO declaration, the General Assembly also adopted a programme of action. This notwithstanding, a Charter of the Economic Rights and Duties of States was adopted a few months later.

### Programme of action

The programme of action outlines measures aimed at ensuring balance in the commodities market, the international monetary system and funding of economic development. It also spells out the measures to promote industrialization, technology exchange procedures and the monitoring of the activities of transnational corporations.

The programme provides for support to cooperation among developing countries, assistance to states in ensuring their permanent sovereignty over their natural resources, the strengthening of the role of the United Nations in the field of international economic relations and the special

emergency measures in favour of the developing countries most severely affected by the economic crisis. Resolution 3202 added that 'the relevant subsidiary United Nations organisations, institutions and agencies shall all submit to the Economic and Social Council, as often as may be necessary, but at least once in a year, interim reports on the implementation of this Programme of Action in their respective fields of competence.'

The programme of action also calls for the adoption of a Charter of the Economic Rights and Duties of States

## The Charter of Economic Rights and Duties of States

The Charter of the Economic Rights and Duties of States was adopted by the 29th session of the United Nations General Assembly in December 1974. Enshrined in Resolution 3281, this charter spells out the principles that should govern the economic relations between states. In its preliminary articles, the charter deals with the sovereign and inalienable right of each state to chose its economic system in the same manner as its political, social and cultural systems in accordance with the will of its people, without any interference, pressure or external threat whatsoever. The charter also outlines the principle of the right of each state to regulate and supervise the activities of transnational corporations. It further underscores the right of all states to participate fully and effectively in the adoption, at the international level, of the decisions aimed at resolving global economic, financial and monetary problems and to access equitably the benefits accruing therefrom. It also emphasizes the duty of all states to cooperate individually and collectively in order to remove obstacles impeding the mobilization and full utilization of their resources for the promotion of the economic, social and cultural progress of their people.

The legal basis of the New International Economic Order raises the problem of the legality of the norms outlined by the United Nations General Assembly. While it is generally agreed that the legal basis of a norm is dependent on the competence of the organ that conceives it, the following questions arise: Are norms such as the Programme of Action and the Charter on the Economic Rights and Duties of States declaratory norms of an existing law or constituent norms of a new law in gestation? And do they have a compelling force? Such a problem, in the final analysis, boils down to the competence of the General Assembly. The issue is complex and controversial.

Advocates of a restrictive interpretation of the competence of the General Assembly challenge the validity and compelling character of the General Assembly resolutions. In fact, the latter contend that the source of international law is solely rooted in the practice of states, international treaties and judicial decisions. Objectively, the General Assembly resolutions do not fall under any of these categories. They further argue that under Articles 10 through 14 of the United Nations Charter, the General Assembly has limited competence, namely, that of making discussions and submitting recommendations but not to legislate for the international community. This was particularly argued by Professor Georges Fisher in an article entitled: 'The Sovereignty of States over their Natural Resources.'[4]

On the other hand, advocates of liberal integration affirm the competence the General Assembly and the binding nature of its resolutions. One of the major representatives of this opinion, Judge Lautherpact, argued that it could be inconsistent with the principles of sound interpretation to downplay the values of General Assembly resolutions, one of the main instruments for expressing the collective will and judgment of the community of nations, and to consider them theoretic, insignificant and incapable of exerting influence on the conduct of Member States.[5]

Based on this second opinion, all the norms outlined by the General Assembly for the creation of the New International Economic Order or the development of the states must be considered as legal rules within the branch of public international law known as international development law. However, this is obviously not the position of the countries of the North, which, in their relations with Africa and the Third World, hardly ceased to trample on these regulations.

## THE RESURGENCE OF THE OLD ORDER

Africa's debt accounted for 50 per cent of GNP in 1983 and its annual debt-servicing currently represents 45 per cent of export earnings. This tremendous debt burden eventually overshadowed the signs of recovery observed in the economies of many African countries in the mid-1970s. The structural adjustment programmes initiated by the World Bank and the International Monetary Fund, which have encumbered debt overhang, bear witness to an ailing economy, to the extent that the social costs of these reforms have seriously compromised the states' development efforts in priority sectors such as education or health, which have been neglected by national budgets.

If the New International Economic Order was aimed at establishing a new type of international economic relations, it was an undeniable failure, and this process seems to have been permanently compromised. Since the end of the nineteenth century 'we have witnessed the epiphany of an economic liberalism' relayed by the World Bank and the IMF, which pressured African states into accepting the conditionality resulting from globalization, 'thus succumbing haplessly to the will of these institutions, abdicating all sovereignty, forsaking any effort to design for themselves … their development project.'[6]

In fact, 'globalization has undermined the sovereignty of states'[7] in an unprecedented manner. 'The money markets reign supreme … with rules which only they themselves are masters of and can hence dictate their laws to states'.[8] Even if we consider these reforms simply in terms of sound management and efficiency, crucial questions arise: Which development project should be implemented? Who defines the development project? If care is not taken in the future, the principal role of the state will be limited to creating the conditions suitable for the effective functioning of market forces. In the meantime, the development of Africa cannot accommodate the creation of an additional or residual state.[9]

Even the sovereignty of states was undermined cunningly when American law sought to extend beyond its borders.[10] Two clear examples of this are the Helms-Burton Act and the Amato-Kennedy Act of 1996. The former bans imports or exports and the financing of goods and services originating from Cuba. It also provides for the suspension of financial assistance to states or international organizations extending

assistance to Cuba. The Amato-Kennedy Act imposes severe sanctions on any company investing over US$40 million in the oil and gas sectors in Iran and Libya. The United States therefore passes legislation to penalize non-American nationals for their activities outside American territory, thereby ignoring the most elementary rules of international law in the field of territoriality, responsibility, non-retroactivity and the rights of the peoples to their national wealth and resources. The denunciation of this claim to extraterritoriality of American law by the United Nations General Assembly (the resolution passed on 2 November 1995 and the complaint submitted to the World Trade Organization by the European Union in 1996) were to no avail, which is an eloquent testimony of the effectiveness of the WTO.

## INTO THE TWENTY-FIRST CENTURY

The call for a New Economic Order, expressed in a particularly clear, firm and responsible manner, was based on simple principles such as bridging the enormous gap between the countries of the North and the South by the elimination of inequalities and injustices.

After over three decades of struggle for the creation of a new, solidarity-based and equitable order, the efforts have resulted in failure, since none of the proclaimed principles has been applied. It has also been a failure both for Africa and the rest of the Group of 77, as evidenced by the worsening terms of trade, the persistent collapse in commodity prices, the disappointing results of the Cancun Summit in 2003 on the issue of 'equitable cotton', capital flight, the relatively weak industrial activity in the states of the South, which confirms the reluctance of the industrialized countries to effectively transfer technology.

Proposed alternative solutions have taken the form of bilateral cooperation agreements, which unfortunately fail to provide the same promises, benefits and prospects as those contained in the Programme of the New International Economic Order because such cooperation is often motivated by strategic interests rather than by the concern for the establishment of a solidarity-based, harmonious, equitable and responsible development.

For its part, Africa began the twenty-first century by adopting initiatives crucial to the continent's progress: the Organization of African Unity has paved the way for the African Union, whose constituent act was signed in Lomé on 11 July 2000. Consequently Africa now has a continental organization organically diversified and with a more markedly 'integrationist' agenda. Launched in 2000, the New Partnership for Africa's Development (NEPAD), which reflects the will of Africans to assume responsibility for their destiny, aims to prevent Africa from depending exclusively on international assistance and to make it attractive to investors. These advances have contrasted paradoxically with the perceptible mark of regression in the ideological and legal substrates from which the New International Economic Order has drawn for its promotion.

The departure of the countries of Central and Eastern Europe from the Soviet Union's orbit that began in 1990 marked not only the end of the Cold War and the triumph of the market economy, but also the questioning of alternatives that have been tried without any tangible results.

Resolution A45/1999 of 21 December 1990, concerning the fourth United Nations Development Decade, marked a decisive political turning point in that it abandoned the terminology of the New International Economic Order. The decline of the New International Economic Order as advocated in the historic resolutions of 1974 has been accompanied by the ascendancy of globalization, whose institutional expression is illustrated by the creation of the WTO on 10 January 1995. Unlike the New International Economic Order, globalization presents an alternative because it does not require any reform other than that of trade liberalization. It is based on the model successfully showcased by the Western world, and, more precisely, the United States.

In the spirit of the New International Economic Order, the analysis of the equality of states, for instance, was not limited to the call for the curtailment of the inequality of power but incorporated the equality of development and justified the acknowledgement of a specific category of developing countries. This analysis is no longer consistent with the fundamental laws of a worldwide market, based on a strict compliance with competition, which implies the relinquishment of discriminatory rules, preferential regimes, and double standards.

Undoubtedly, the WTO does not ignore developing countries. From this viewpoint, it entails neither a rupture nor major innovation as regards the North-South gap. The spirit of the constituent text is different, however, owing to the liberal context, and if the developing countries can hope to receive special treatment, such a status no longer appears as a temporary favour justified by the objective of rapid market access.

Should one also cancel what has been previously achieved under the influence of the New International Economic Order? Not at all. Most of the texts are mere recommendations, and it will suffice to forget them. With regard to the rules of positive law establishing preferences, there is little doubt that these will systematically become irrelevant. One could simply conclude that it is necessary to revert to the neutrality of positivism. One can legitimately wonder, however, whether this reversion to 'political realism' and to 'a greater normative orthodoxy' is not due to the will of the most powerful to accede to new markets rather than to the demands of formalism and to any legal neutrality.

What remains certain, however, is that the search for a New International Economic Order can be seen as an outdated issue as far as its initial interventionist and conflict-prone orientation is concerned; yet it remains an indispensable historical necessity regardless of the form it may eventually take.

## NOTES

1.    Kamitatu (Massemba) in A. Pellet, *Le droit international du développement*, '*Que sais-je?*', Paris, 1980, p. 7.
2.    United Nations General Assembly Official Documents, 3872, June 1974.
3.    *Revue Europe – Outremer*, no. 5, avril 1974, pp. 9–10
4.    *Annuaire Africain de Droit International* (AZFDI), 1962, pp. 516 and 555.
5.    *Opinion dissidente dans l'Affaire du Sud-Ouest Africain*, CIJ *Recueils des arrêts, ordonnances et avis*, 1950, pp. 126 and 55.

6.    P. Hountodji, 'Processus démocratique et enseignement philosophique en Afrique', in R. Pol, *Droit, Philosophie et Démocratie dans le monde*, Ed. Librairie générale française, Paris, 1995, pp. 125.

7.    Cf. R. Charvin, *Relations internationales, Droit et Mondialisation, un monde à sens unique*, Paris, 2000, pp. 154.

8.    B. Hima, *Mondialisation et démocratie : les termes d'un double challenge pour l'Afrique*, Revue Nord-Sud, XXI, n° 12, 1998, pp .112.

9.    Cf. Y. Vignon, *Reflexions sur la privatisation des entreprises publiques en Afrique*, annales de l'Université de Lomé, Série Droit-Economie-Gestion, Tome 16, 1996, pp. 221.

10.    Cf. R. Charvin, *Relations Internationales, Droit et Mondialisation*, op. cit., pp. 163.

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# CONCLUSION

*Iba Der Thiam*

After years of war and international tension, as well as economic, scientific and technological progress, the world has undergone unprecedented upheaval during the twentieth century.

New hopes have arisen since 1994: with the wave of independence in the 1960s, the fall of the Berlin Wall, the disappearance of the world communist movement, the end of the Cold War and the arms race, the world is now evolving towards a new era of peace, even though domestic crises of an ethnic, tribal or religious nature still threaten certain countries. Colonialism has been defeated, apartheid put down, the balance of terror abolished. We are witnessing the genisis of a new international order founded on the promotion of human rights, democracy, a free press, market economies, the protection of women's, children's and minorities' rights and the right to a better quality of life through respect for the environment. This new international order must help to bring about certain changes needed in the international relationships established in the wake of the Second World War and to create mutually advantageous and more equitable economic and commercial relations between North and South. It must also facilitate the opening of Western markets to the products of the developing countries, and the reduction of the ever-increasing inequalities in science and technology, communications, computer use and culture.

Indeed, the United Nations and the FAO are now headed by Africans, growth has returned with the improvement in the main macro-economic indicators, and an African contributed to the success of the American mission to Mars. Clearly, these fine accomplishments, along with the edifying signals of progress in the struggle against corruption and conflict (both internal and external) must be recognized. Yet, we must also acknowledge that a great deal still remains to be done in developing countries. Day by day, poverty's grip grows a little tighter, while unemployment, underemployment and malnutrition are on the rise. Diseases, such as tuberculosis, that were once in decline are returning with a vengeance, and AIDS continues to be a major worry. Illiteracy is still widespread. Investment, though considerable, is still desperately inadequate in certain developing countries, especially in Africa, and debt, which remains a heavy burden on their economies, is constantly sapping their capacity for growth. Peace – the missing link between development and democracy – is still unknown to many regions, and this compromises the prospects for ecologically viable and sustainable development. The sense of solidarity embracing all of humanity is on the ebb as evidenced by the disturbing drop in development aid. The growing support of right-wing movements in the West is accentuating fears of exclusion, selfishness and covert racism, and the conditions for a new and better-balanced partnership between rich countries and poor still appear far off.

There are therefore many challenges still to be met, the greatest being the free circulation of knowledge and people (the essential counterpart to that of capital, goods and services, and ideas), the democratization of international relations and the setting of fair prices for raw materials supplied by developing countries. In the new century, peace and the future of the planet will depend on the resolution of these crucial issues.

# 8

# WOMEN

## Françoise Thébaud

The first edition of the *History of Humanity* was published under the auspices of UNESCO in 1965. Since then, the world and our knowledge of it have changed considerably. This is especially true of the status and social position of women, who, at the beginning of the twenty-first century, number three billion individuals and constitute roughly half of the human race. This is even truer in regard to sociological, anthropological and historical studies of women and relations between the sexes (now commonly known as genders). Prior to the end of the 1960s, these studies were few and far between, or limited to static and picturesque descriptions of an immutable feminine status. They developed on the initiative of feminist movements and have grown in number over the last three decades, initially in North America and Europe, then on other continents, especially in fledgling democracies (for example, in Latin America), where they are regarded as a factor of democratization and social progress. In denouncing discourses centred on myth or tradition, in criticizing the blindness of the social sciences to the presence of women and to differences between the sexes, they made gender an essential category of analysis, alongside other more established categories such as national, ethnic or social affiliation. Today, at any level, it is difficult to refer to human beings neutrally. Differences between men and women now rank highly among the differences which have been perceived, or exposed. Following a long lack of interest on the part of the community of historians, women's history and gender issues have featured prominently at the last three International Congresses of Historical Science (Madrid 1990, Montreal 1995, Oslo 2000).[1]

Although the developments outlined above explain the need for this chapter on women, it is neither straightforward nor simple to write. As part of this extensive publication chiefly concerned with the scientific and cultural development of humanity, the present study must first of all take into consideration the philosophy and structure of the whole. As with the issues relating to young, elderly or handicapped people, those concerning woman cut across the entire range of approaches, whether chronological, thematic or regional. This chapter – a potentially inexhaustible thematic summary – will need to consider

both the chronology and the variety of situations existing in the different continental, national, or regional contexts. Written by a French woman, it must as far as possible avoid giving a Eurocentric perspective and should not give priority to Western examples. Rather, it should place equal emphasis on points of international convergence, and on national and group identities. In line with the rest of the collection, it will focus on structures rather than events. However, the latter cannot be omitted from a historical analysis of the twentieth century, a century marked by numerous wars, dictatorships, revolutions, scientific discoveries, and technological transformations. Although there is such a thing as a biological female sex, there is no condition of women existing outside time and space. As research on women has emphasized, at times so trenchantly as to appear provocative, 'Woman' does not exist.

A brief presentation of the debates that have recurred in women's studies, and especially in women's history, over the last 30 years is a useful preliminary to any attempt at providing an overview and choosing an outline to follow. In its early days, women's history developed by declaring that the condition of women is not the product of a female nature that supposedly induces an intangible status and roles that are repeated from one generation to the next, but is the product of a historically determined social and cultural construct. It preferred the concept of the position of women in society, and later, of sex- or gender-related social relations, to the over-essentialist concept of the condition of women, and at times, particularly in African history,[2] it has defined itself in opposition to anthropology, seen as a 'colonial science' describing societies called 'traditional' or 'immobile'. Today, in Europe at least, the relationship between the two disciplines is less conflictual. However, although a study of the construct and various meanings of femininity may be justified, the approach developed here will be primarily historical, favouring processes and evolutions.

Evolution does not denote linear progress achieved by the tireless campaigning of women activists. Without denying that, for millions of women, improvement can be measured by the acquisition of new rights or better living conditions, today women's history is conscious of backsliding and the displacement and reconstitution of inequalities. For

this reason, it is no simple task to suggest a chronology of the twentieth century based on women and gender. In Europe and North America,[3] the 1960s and 1970s – marked by peace and prosperity, by technological innovations such as the invention of the contraceptive pill, by the growing participation of women in the labour force, by the rise of more and more anti-establishment movements and the emergence of a new kind of feminism – heralded the start of a fundamental shift in relations between men and women. This shift advanced the individual rights of women, and gradually granted them economic, legal and symbolic autonomy in relation to their fathers and husbands. However, what is the situation like on other continents, where family pressures, poverty and often war, all have an impact upon women? According to the context under consideration, the answer often varies with each continent, country and village, where the construction of a well or a school may transform daily life. Most international reports highlight improvement in the situation of women from the 1970s onwards as well as its deterioration in places during the 1990s, due to the world crisis, the development of liberalism and economic globalization, the rise of fundamentalism, the ravages of AIDS, or the increase in local conflicts. This deterioration led to the United Nations decision to hold an additional World Conference on Women (Beijing, 1995) as a follow-up to the three that took place during the 'Decade for Women' (1975–85).

The concept of progress also presupposes agreement about a particular development model. Today, Western feminists – separated into an egalitarian branch, and a differentiating branch based on according greater value to what is feminine – recognize that difference is not the opposite of equality (but of similitude) and that the two concepts can coexist. In the 1980s, national minority women activists and Third-World feminists criticized the imperialism of the Western model (that of a wealthy white woman), in the name of different cultural traditions and other social and political realities. As emphasized by the title of an American book published in the 1990s, on the history of women in the United States,[4] this legitimate criticism led to greater awareness-raising of inequalities between women in the same country and in the world, and reoriented women's studies towards an approach more inclusive of difference. However, recognition of diversity should not disguise the existence of laws, which can be liberating or oppressive for women, of situations of autonomy or minority status, or of significant indicators of their condition (for example, the literacy rate or the rate of mortality in childbirth). Liberty, dignity, and equality are universal values, endorsed by the international community, but challenged by the world's most conservative states. During the most recent international conferences (on population in Cairo, 1994, or in Beijing), these states attempted to counter such values with the concepts of complementarity of the sexes, or equity.

'Unequal sisters': the world of women is made up of common ground (motherhood, ensuring the cohesion and care of the family, vulnerability to violence), of solidarities which may be partial and temporary, and of differences which, on a world scale, are often greater than the level of sexual inequality measured in each country. Being the result of inequalities between societies, inequalities between women from one place to another (a state can be 'ahead' in one aspect and 'behind' in another) may be accentuated by issues relating to social affiliation, race, age or religion, and by the persistence of ancient hierarchies between peoples (Africa, former white colonies), or of castes (India). Without a map to show the situation today (see *The State of Women in the World Atlas* by the Canadian Joni Seager in the bibliography), this global panorama must avoid any generalization or at least, where information is available and relevant work has been produced in the field of women's history, any generalization must be qualified by contrasting examples. Despite the litany of women's woes over the last century and in the world today, our overview must ultimately present women, not solely as victims of the established order, but also as people directly involved with their own lives and histories, not just well-known personalities, but anonymous women too. This is the latest lesson to emerge from recent debates and from development policies.

These preliminaries, to be borne in mind when reading the pages that follow, lead me to the following choice: after focusing on the constant burden of war, and in counterpoint, the gradual affirmation of women's rights, the chapter will tackle the themes of the family, motherhood, work, and access to knowledge and power, from a combined chronological and geographical point of view.

## THE CONSTANT BURDEN OF WAR

The twentieth century was one of the bloodiest in the history of humanity. War in all its forms was omnipresent throughout: two world wars, colonial and post-colonial wars, wars of national liberation, not to mention the civil wars that destroyed the fabric of many societies. The issue of the relationship between war and social change, and in particular of its impact on gender and the status of women, has often been raised by both contemporary commentators and historians. Does war lead to the emancipation of women? Before considering the involvement of women in conflict and giving a qualified response to this question, it should be emphasized that war is synonymous with violence, and that first and foremost, women are its victims.

Nine million military personnel were killed between 1914 and 1919. There were 50 million deaths between 1939 and 1945, of which 20 million were Soviet and half of those were Soviet civilians, and there have been millions more since. War claims the lives of men (husbands, sons, brothers), who may never come home, or who return injured and traumatized. Universally present – although experienced in various ways according to place and culture – solitude, distress and mourning are the lot of women. Women have sometimes organized peace movements in the name of life and motherhood, only to then be denounced as traitors to their communities (most recently to date, the 'Women in Black' of Israel or Serbia). War, and its accompanying loss of income and pillage of industrial or agricultural wealth, also exacerbates the difficulties in material living conditions and weighs particularly heavily on women, who are responsible for feeding their families. In Europe, drastic shortages were prevalent only in parts of Central Europe during the First World War, but 25 years later, the whole of German-occupied Europe was affected. People were forced to return to a way of life associated with a subsistence economy, and the shortages ultimately led to hunger riots. Elsewhere, in rural economies, the destruction of crops by armies or bombardment could be catastrophic.

The exacerbation of poverty beyond endurable limits, or the lack of separation between the front and rear lines, increasingly common in contemporary warfare, frequently led to the exodus of women, children and the elderly, struggling to escape conflict and famine. In the world today, over 80 per cent of refugees are women and children, fleeing countries such as Afghanistan, Rwanda, Sudan and Serbia.

Increasingly, war has a direct physical impact on women, and the 'rules of war' have tried in vain to make their bodies sacrosanct. Although, the majority of totalitarian regimes enforced the appalling concept of family guilt, the Nazis' policy of extermination of Jews and Gypsies, and the barbarities that took place in the occupied territories (in particular against the Slavs and the resistance), pushed back the boundaries of abomination. The names of the death camps (such as Auschwitz, Sobibor and Belzec) and of the civilian massacres (such as Guernica in Spain, Baby Yar in the USSR, Oradour-sur-Glane in France) will remain indelibly printed on the collective memory. Perpetrators of genocide (the term is also used in reference to the Khmer Rouge in Cambodia, to Rwanda and former Yugoslavia) show no particular pity for the female sex, but quite the opposite since women are mothers or potential mothers of future generations. In all wars, women, seen as part of the spoils and as the 'warrior's well-earned rest', have been raped (at Nanjing sacked by the Japanese in 1937; in Spain during the Civil War from 1936 to 1939; in Germany during liberation by Russian soldiers, 1945; in Bangladesh in 1971; and elsewhere). Others, seen as traitors to their nation, had their heads shaved.[5] But the systematic practice of rape (notably perpetrated by the Serbs against Bosnian Muslim women),[6] recently made it a weapon of war and 'ethnic cleansing', recognized as a war crime thanks to campaigning by international women's networks, and punishable by the International Criminal Tribunals of The Hague, established in 1993. Although a certain proportion of men are brutally tortured and massacred in war, rape has the specific aim of humiliating the enemy and publicly desecrating the values it holds sacred to conquer 'ethnically' (via an interposed womb representing the homeland, or mother earth) and to destroy the blood ties of the other culture. As victims of this violation, defiled and dishonoured, raped women have often been rejected by their families.

Twentieth-century conflicts were wars of men and material. They required the support and assistance of women behind the lines, mobilized in the war effort to bolster the morale of troops and civilian populations, called upon (and often compelled by necessity) to replace men in fields, factories or offices to keep the country alive and the war machine moving. This led to a complete subversion of traditional gender roles. The number of women in employment increased (from 20 to 50 per cent among the belligerents in the First World War, and still further in the United States and United Kingdom between 1939 and 1945). Women broke into traditionally masculine trades (e.g., lathe operators producing shells or engine drivers), and, in increasingly varied roles, into the armed forces. The USSR recruited women combatants as early as 1943, including heroic fighter or bomber pilots. In this way, women in countries at war took on new social and family responsibilities, tested their abilities, demonstrated the full range of their skills, and conquered the public sphere previously occupied by men.

Women also took part in resistance against occupying forces and in wars of decolonization and national liberation. Among female members of resistance groups who earned a place in history this way are: in France, Berthie Albrecht (co-founder of the 'Combat' movement, executed by the Germans in 1943), or the communist Danielle Casanova, who died as a deportee; in Algeria, Hassiba ben Bouali (planter of bombs, killed in 1957 during the Battle of Algiers), or Djamila Boupacha, the FLN (Front de libération nationale) liaison officer whose arrest, torture and trial became an international affair in 1960. However, this phenomenon extended worldwide. While a minority joined the guerrillas, courageously transgressing behaviour codes, a greater number supported fighters behind the scenes (hiding, supplying, feeding, healing) or rebelled against the repercussions of occupation. The decades-long struggle by black South African women for freedom of movement (against apartheid and the carrying of passes) has similarities with the fight of West African women against the poll tax. This fight, conducted with daring to secure their economic survival, drew them into the political struggle despite and because of repression. Although they were subjugated to patriarchal authority, Kikuyu peasant women joined the Mau Mau rebellion in Kenya for similar reasons. The British, who termed their lengthy resistance 'passive', responded to it with a forced return to the villages and the establishment of women's progress clubs. However, they misunderstood the commitment of these women, 35,000 of whom were imprisoned between 1952 and 1958, and whose mental and social environment was profoundly changed as a result. Among those imprisoned was the rebellion's most famous nationalist woman activist, Rebecca Njeri.[7] In 1919, Chinese women played an active role in the 4 May Movement (against foreign imperialism and the Confucianism of the traditional elites) and raised the issue of women's rights; and many Indian women took part in Gandhi's Non-Violent Resistance and, in doing so, gained legal and political equality in independent India.

War, however, was rarely propitious to the evolution of gender relations, even though the awareness and individual behaviour of some women was changed by it and some ground was gained – for example, in many Western states, the right to vote, or the incorporation of the principle of equality in their constitutions. In such states, the mobilization of women was seen as an interim measure (Plate 51). Once the armistice was signed, they were requested to step down in favour of male ex-combatants and to repopulate the country. Decolonized states, wishing to assert their national identity, have often given women the role of guardians of traditional values or have emphasized priorities other than their emancipation. After 1962, Algerian women were obliged to conform to Arab-Muslim values, to stay at home and wear the veil, while today, Palestinian women activists find it difficult to marry after imprisonment, which stains the family honour. Despite the increasing volume of women's war literature, few women have been or are able to give collective meaning to their experiences and above all, to impose their view of things. Nationalism and women's rights have often been incompatible. The lesson to be learned from the twentieth century is that peace and democracy, open to the circulation of ideas and people and to the constitution of feminist and women's organizations, are more favourable to the promotion of women's rights than war.

## THE EMERGENCE AND AFFIRMATION OF WOMEN'S RIGHTS

Structuralist anthropologists[8] set as an invariant the existence of a 'differential valency of the sexes' characterized by the dominance of the masculine principle over the feminine principle and connoting the binary system of opposites that we use in order to think. According to them, on a historical and world scale, no societies, even those that are matrilineal, exist without masculine domination. This can be explained by the will of men to overturn the privilege of women and to appropriate their reproductive capacity to engender sons. The resilience and longevity of this system of representation – and only too often, of real violence – explains why the concept of sexual equality and of the autonomy and rights of women had difficulty emerging. In the West, this concept, which made fleeting appearances in various places and at various times, gradually asserted itself in the nineteenth century, stimulated by the challenges to other hierarchies and forms of oppression such as slavery, religious persecution, feudal relationships or class relations. The concepts of reason and progress derived from the philosophy of the Enlightenment, then the movement towards democracy, swelled an egalitarian movement calling for the equality of all individuals and extended the Declaration of the Rights of Man and the Citizen of 1789 to include women. Utopian socialism took this further, adding enhancement of the status of motherhood and belief in the moral superiority of women. Marxist socialism tended to subordinate the issue to the triumph of the revolution, prior to its manifestation (post-1917) in states where, despite the fact that the reality was more complicated, the issue of sexual inequality was considered as settled.

In the nineteenth century, religious dissidence, especially Protestant, was also a breeding ground for feminism (the term took on its current meaning at the end of that century), particularly in its dualist form, which demanded rights in the name of the difference between the sexes. In the longer term, it raised the inescapable issue of the sexism of the major religions, condemned by numerous contemporary feminists such as the Indian Chandra Rami Chopra, who after the Cairo and Beijing conferences recently stated that the common ground of all religious laws is their discrimination against women. Is Taoism, which attributes equal power to the female and male principles of yin and yang, more egalitarian than Confucianism, Buddhism, Judaism, Christianity or Islam, which appear more concerned about women's duties than their rights? In any case, if one takes into account the evolution of doctrine (recent years have even seen the development of a feminist theology, mainly in the Protestant world) and distinguishes reference texts from practices rooted in tradition and determined by state policies or ecclesiastical authorities, the influence of religion appears to have been decisive[9] and the secularization of states and societies is seen as a condition favourable to the assertion of women's rights like education, legal and economic autonomy, political citizenship, and later, contraception.

The conquest and codification of these rights have a history whose thread, interrupted by the previous point, I will now pick up again. Feminist associations existed in Europe and the United States at the beginning of the twentieth century and were organized as federations at the national and international levels. The International Council

of Women was set up in 1888 on the initiative of American women, and possessed 17 European sections in 1914. Travel, correspondence and international congresses enabled the emergence of a transnational feminist culture, and the concept of the 'new woman' (independent and creative) gradually crossed frontiers, reaching the colonies and other continents. This was the title of an essay published by the Japanese writer Hiratsuka Raicho, who founded the review *Seito* ('Bluestocking' 1911–16), in order to liberate women's talents. She went on to obtain political rights for Japanese women from the American authorities in 1945, and later devoted herself to the anti-nuclear movement.[10] This was also the title given to a Saigon-based review in 1930s Viet Nam, while in Egypt the interwar period saw the launching of the feminist journal *L'Égyptienne* ('The Egyptian Woman'). Constrained by the inequality of relations between nations, this international movement twice came to grief on account of war, while after 1945, feminism appeared to lose impetus in the West despite the long-term impact of Simone de Beauvoir's work *The Second Sex* (1949).

However, during the second half of the twentieth century, intergovernmental organizations (mainly the United Nations, and to a lesser degree the Council of Europe and the European Economic Community) played an important role in the development of equality between men and women.[11] This role evolved and became more prominent in the final decades of the century, after the United Nations had responded to issues raised by new feminists in Western countries (condemnation of patriarchy, the politicization of private life, demands for sexual autonomy and the right to family planning), by proclaiming 1975 International Women's Year, and by organizing, in Mexico City, the first conference on the situation of women in the world, as the prelude to a decade on the themes of 'equality, development and peace'. Taking its cue from feminist and women's organizations (whose numbers grew outside the Western world), from women experts from the 'Southern' countries, and from non-governmental organizations, the merit of the United Nations, whose member states were also increasing, was also to promote discussion in the decolonized world on the relationship between women, gender and development and to undertake action along those lines.

The San Francisco Charter and the Universal Declaration of Human Rights of 10 December 1948 both prohibit sexual discrimination, along with any distinction on the basis of race, colour, language, religion, opinion, national or social origin, in the enjoyment of human rights (extended to include economic and social rights), and fundamental freedom. This was thanks to campaigning by women's organizations united under the umbrella of the Inter-American Commission on the Status of Women and to the action of energetic women such as Eleanor Roosevelt (1884–1962), the widow of the American President, a tireless activist on all fronts, who went on to chair the United Nations Commission on Human Rights. The Charter and the Declaration constituted benchmark texts for the promotion of women's rights in the world, but their effectiveness was limited because they followed the legal tradition of speaking of the beneficiaries of rights abstractly and with no reference to their sex. Without sexual and procreative self-determination, the rights to life, liberty, dignity and security of person are not effectively guaranteed

for the female half of the human race (any more than is equality in marriage). Moreover, the transformation of the Declaration into covenants able to bind states parties was slow in coming (two covenants adopted in 1966 did not come into effect until 1976), and monitoring procedures lacked teeth. The United Nations Commission on the Status of Women had a limited mandate and no powers of investigation; it nonetheless gave an impetus to the ratification of specific treaties (on the political rights of women, the nationality rights of wives, marriage and the question of consent), and prompted by communist countries in the 1960s, it advanced the project of an instrument able to deal with women's rights as a whole.

The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), an amalgamation of the policies elaborated over a period of thirty years, was adopted in 1979. It was the first international treaty to view discrimination against women as distinct from other forms of discrimination and to give sexual difference legal status. In its 30 articles, the convention defines this type of discrimination in broad terms (including all limitations, such as family and sexual, on the equal exercise of individual rights) and makes provision for temporary special measures (legally binding) in order to promote de facto equality. The most important document to come out of the 'Decade for Women', CEDAW also had limited application. It had been ratified in 1995 by only 137 states, which were committed to the submission of national progress reports every four years. Over 40 states parties had entered substantive reservations as to its content.

Mexico City 1975, Copenhagen 1980, Nairobi 1985 and Beijing 1995 combined with the parallel NGO forums that brought together 6,000 women in Mexico and 30,000 in Beijing. These four conferences gave rise to a body of gender statistics, which raised the profile of the women and gender issues, shaped world public opinion on the themes of equality and development, and laid down guidelines, in declarations and action programmes, for international organizations and national governments. Without doubt, the most important outcome was the recognition of women's work (paid or unpaid), and the need for their active participation in development projects, which were often planned from a neutral perspective without any analysis of the effects on women and gender. In Nairobi, following a decade of specific programmes with disappointing results, emphasis was placed on the central role of equality (in terms of opportunity and legal rights) as the ultimate aim and as an instrument of peace and development. Two concepts and strategies that had been forcefully reasserted in Beijing also emerged: 'mainstreaming', or the incorporation of a gender perspective and of equality of opportunity between men and women in general programmes and policies;[12] and 'empowerment', designating both the strategy of giving power to women at all decision-making levels and the process by which they individually and collectively increase their power over their own lives and in society.

The changes that had come about in half a century of international legislation were clearly apparent in a radically new approach to women's rights in the 1990s, which emerged in response to the previously mentioned upsurge in violence and violation. The second World Conference on Human Rights (held in Vienna in 1993) affirmed that 'the human rights of women and of the girl-child are an inalienable, integral and indivisible part of universal human rights', opening the way for the identification of specific forms of violation (particularly the forms of sexual violence included in the December 1993 Declaration on the Elimination of Violence against Women) and for the recognition of a new generation of human rights, which included reproductive and sexual rights. Despite opposition from many quarters, the entitlement of every individual to reproductive rights was recognized by the Cairo conference on 'Population and Development', and the entitlement of women to sexual rights was recognized in Beijing, although without imposing abortion legislation on states parties. This huge victory for feminists throughout the world heralded a new era. However, for these rights to become effective, their full implications for civil, political, social and cultural rights needed to be followed through and appropriated by women.

Throughout the world today, all socio-economic indicators, with the exception of life expectancy, are less favourable for women than for men, and the development index needs to be adjusted to take into account the disparities between the sexes, as proposed by the United Nations Development Programme in 1995. As measured by the GDI (Gender-related Development Index), sub-Saharan Africa, Afghanistan, and a large part of South-East Asia are extremely low-ranking, and post-communist Eastern Europe has fallen back sharply, since sexual equality depends as much on the policies a state implements as on a society's income. Formal equality has progressed almost everywhere, but legal discrimination is still extremely widespread, mainly with regard to civil rights in developing countries. The family and its traditions are still at the hard core of female dependence, providing a backdrop to the gender division of labour, the overworking and physical coercion of women.

## FAMILIES: THE DECLINE OF PATRIARCHY

Patriarchy may be defined as a system in which men (fathers or husbands) dominate women, utilizing their labour (mainly domestic) and controlling their sexuality and reproductive capacity. It manifests itself in both the formation and composition of the family, in intra-family relationships (legal and everyday), and in the gender division of labour. At the start of the twentieth century, it existed throughout the world in varying degrees (in Africa, colonization wiped out the prestige of women chieftains and queen mothers along with the existence of women's associations). It is gradually disintegrating in places, but on a world scale, the family scene generally remains highly contrasted.

Depending on the level of education and urbanization, age at marriage generally rose in the twentieth century. However, the proportion of girls already married at a very young age (15–19) remains high, particularly in Africa (over 50 per cent in Mali and in Niger), and in Asia. In India, the legal system is experiencing difficulty combating the age-old custom of child marriage, while in Pakistan many young girls are married to men within their families, which increases their dependence. Pakistan is a Muslim country where there is little polygamy, unlike Muslim West Africa. In Nigeria, Mali or Senegal today, polygamy affects over 40 per cent of married women, but the lack of previous

surveys makes it difficult to measure the situation's evolution. Pakistan also practises the highly restrictive dowry system, in contrast to the bride-price still paid by the majority of African men to their wife's family to 'compensate' the loss of a source of labour and reproduction. For a long time, this was paid in goods (especially in head of cattle) or in labour, then increasingly in money with the monetization of the economy, but although recently some governments have occasionally prohibited the practice, it remains socially embedded. In both cases, marriage for a young woman very frequently means going to live with her husband's family, where several generations, and sometimes all the brothers and sisters, live together.

In Europe, North America and Australia, the institution of marriage at first grew stronger in the twentieth century, with cohabitation and illegitimate births declining among the working classes and the nuclear family becoming more widespread. It was called into question from the 1970s onwards (in particular by the feminist movement), and this was reflected by the proliferation of often-prolonged cohabitation among young people (especially in Sweden and France), an increase in celibacy, and a rise in the divorce rate, although strictly Catholic Ireland did not legalize divorce until 1996. This challenge to established ideas gave rise to, and accompanied, a wave of reform that led to the incorporation into the private law of Napoleonic code countries, belatedly, after their common law counterparts, of the idea of equality between husband and wife and to the elimination of the concept of head of the family. Civil law henceforth authorized a multiplicity of female roles and family models, but the freedom won has sometimes been at the cost of solitude (divorced men remarry more frequently and more quickly than women) and relative poverty, especially in the case of single-parent families. Similarly, tolerance towards homosexuality, whether female or male, has considerably increased in the West over the last 20 years, although homosexual unions have been recognized by only a few countries (here again, the Scandinavians led the way), but the WHO did not remove homosexuality from the International Classification of Diseases until 1992, and in numerous states, it is ignored as a social reality or is a punishable offence (even by the death penalty).

The idea that a married woman belongs to her husband governs social relations, and, in a number of countries, the law itself. The most extreme expression of this is the custom of *suttee* (whereby the wife commits suicide after the death of her husband), still practised at times in India despite the fact that it is prohibited. In Arab countries, modern law, which for the most part carries more weight than Muslim law *stricto sensu*, does not apply to the domestic citadel of the family and to women, pawns in the battle between modernists and traditionalists. Women remain subject to codes of personal status directly inspired by *sharia* (Muslim law), sometimes in its most regressive interpretation (Plate 52). In these countries, as in other states in Africa and Asia, women suffer constraints on their freedom of movement (to the extent of being confined to the home) and must submit to dress codes which emphasize their enclosure (veil or *chador*). Constraints of this kind, the history of which still has to be charted (the current upsurge in religious fundamentalism shows clearly that political climate is just as important as cultural tradition), are in no way comparable to those associated with 'beauty culture', even though this was partly brought about by the cosmetics industry which,

from its beginnings in the United States in the 1920s and 1930s, invaded Europe post-1945, and today is spreading throughout former Eastern-bloc countries and starting to take hold in Asia.

Domestic violence is universal and remains a major cause of injuries inflicted on women and of female mortality in the world. Long shrouded in secrecy, this phenomenon has left few traces, mainly in the form of police or court records, which are only just beginning to be examined from the angle of women's rights. Its history has not yet been written, but a start has been made on raising awareness of its multiform reality. In Sweden, the ban on husbands beating their wives dates back to 1858, but in the rest of Europe, in the United States, or in Latin America, where domestic violence is rooted in a very macho culture, domestic violence mainly takes the form of battering, marital rape (a recent concept and an act which has been made a criminal offence in some democracies), and sometimes murder, committed by a drunken husband or partner. In many developing countries, violent acts may also be committed by members of the extended family (for example, mother-in-law) and may take extreme forms; such as the honour killings that often go unpunished in Pakistan, or bride-burning in India resulting from dowry-related conflicts. It is accompanied by social violence carried out by men against single women, those whose behaviour is considered unconventional, or women classed as prostitutes. There is also violence fostered by many governments in a general political atmosphere of repression.

Primarily controlled by men, prostitution is an activity that survives by violence, and its existence tends to perpetuate patriarchal family structures. It is an extremely ancient and widespread practice, which has existed in various forms on all continents (prior to 1949, China was the largest market of human beings in the world), and it endures today. It is a means of survival for women at the local level, but increasingly supplies an international sex market, which prospers due to economic disparities between regions of the world (Eastern Europe, impoverished in the 1990s, supplied its contingent, alongside Asia, Brazil and Nigeria) and to sex tourism. The female body is a commodity. It is also subjected to a quite specific form of violence, i.e. the genital mutilation carried out on 40 per cent of African women in around 30 states stretching from Mauritania to Egypt and Somalia. Excision (removal of the clitoris and the labia minora) and infibulation (in addition, the removal of a section of the labia majora and the stitching up of a large part of the vaginal orifice) are extremely damaging both mentally and physically. Such mutilation is associated with ethnic or religious traditions about whose origin little is known, and it is intended to diminish the sexual appetite of the woman and 'cleanse' her body, which is subordinated to the sexual pleasure of the man alone, and to guarantee virginity until marriage. These practices are carried out by women on girl infants or girl children whom they wish to incorporate into their communities (two million victims every year at the present time). They were condemned from time to time by missionaries or colonial powers, along with other initiation rituals, but have more often than not been tolerated in the name of 'respect for tradition' or ignored altogether. For a long time, the independent states did nothing and the WHO (World Health Organization) invoked the social and cultural context before taking a stand in 1982. The condemnation of these practices by Western feminists in

the 1970s irritated some African women's movements, but other African women, such as the Senegalese Awa Thiam, worked and are still working towards their eradication. Since the 1980s, many states have adopted legislation to counter these practices and some, such as Burkina Faso, have been carrying out effective campaigns even down to the village level, out of consideration for the health of young girls and future mothers.

## MOTHERHOOD AND WOMEN'S WORK: TOWARDS AUTONOMY

All societies have valued and continue to value motherhood, which confers dignity on women. At the beginning of the twentieth century, Western feminists demanded rights and social protection in consideration of this special status. Other women used it to resist oppression, such as the Argentinean mothers who demonstrated every Thursday on the Plaza de Mayo, wearing babies' white flannel nappies as headscarves, to condemn General Videla's dictatorship (1976–83), and demand news of their 30,000 missing ('disappeared') children.[13] But the place of motherhood in the lives and identities of women became extremely varied in the twentieth century with contrasting situations in developed and developing countries, from continent to continent, and from country to country.

Europe had virtually come to the end of its long demographic transition[14] by the beginning of the twentieth century, and the birth rate remained low throughout the century – except for the baby boom following the Second World War. The low birth rate was nevertheless fought against by dictatorial regimes, and by one democracy – France, which brought in policies that were a mixture of controls and incentives in order to encourage births. In North America, the birth rate was also low, and it remained a land of immigration. During those decades in both Europe and North America, however, motherhood underwent three major changes that promoted the autonomy of women vis-à-vis their biological determination and conjugal ties. First, the improvement in medical care and social protection set up by welfare states (although less protective in the United States) led to a sharp decline in maternal and infant mortality rates (respectively, from 5 per 1,000 to less than 10 per 100,000 births, and from over 10 per cent to less than 10 per 1,000), and provided social assistance for the function of reproduction (paediatricians, psychologists, nurseries and primary schools). Secondly, the development of the consumer society (from the 1950s and 1960s onwards in Europe, and earlier in the United States) considerably alleviated household tasks and intellectualized what is sometimes described as the 'the profession' of mother, so complex had the activities of motherhood become. Finally, the adoption – often slow and difficult in Catholic countries (1960s and 1970s) – of laws authorizing contraception and abortion, a major revolution, gave them control over their fertility and their own bodies and undermined the old system of domination and mental representations. However, one needs to be aware of social and racial disparities in maternal status (especially in the United States), of the deterioration of social systems in former Eastern-bloc Europe over the last ten years, and of the difficulties encountered in having children in some countries like Germany and Japan, where little is done to make work compatible with motherhood

and the average number of births per woman is less than 1.5.

Major changes also took place on other continents, and often more quickly, especially as far as the fertility rate was concerned. On the urbanized continent of Latin America, the transition occurred early in predominantly white countries and became widespread after the Second World War. The level of fertility (2.7 children per woman at present) decreased throughout the continent from the 1960s onwards through a combination of the modernization of the wealthy sectors of society and of a 'Malthusian' approach to poverty, which made use of the pill and, even more frequently, of female sterilization. Brazil is a case in point. The spread of Malthusianism, which enabled women to escape the risk and burden of repeated pregnancies and to feed their children better, was encouraged by the authorities and by the United States, fearing the social tensions of a 'demographic bomb'. The issue of the consent of women and couples to national and international family planning policies should be raised, in fact, especially with regard to Asia, which has seen a sharp fall in the birth rate per woman over the last four decades (the present average is 2.6 children per woman), and renewed attempts to impose a one-child policy in China. There, as in India, Pakistan, or South Korea, the lower birth rate has sharply highlighted the time-honoured preference for male children (shared to a varying degree by many societies). It would appear that around 100 million females have been eliminated due to the abortion of female fetuses (detected by amniocentesis, and over the last two decades, by ultrasound scan), the infanticide of female babies, mistreatment, or neglect.

Sub-Saharan Africa has long been presented by demographers as an exception. Here, the fertility rate still exceeds five children per woman due to early and widespread marriage, little recourse to contraception (even in urban areas, where middle-class women can find cheap domestic staff or call on the free labour of young female relations from rural areas), and a value system that favours births. However, the recent example of Kenya, where new property and inheritance laws have considerably increased women's rights and information campaigns and new services have been expanding in rural areas, has shown that the fertility rate can fall sharply in Africa too. Even so, this is where maternity-related risks have been highest, due to a very low level of medical care, serious consequences such as vesico-vaginal fistulae, which leave women incontinent and ashamed (sometimes repudiated), a particularly high maternal mortality rate (from 0.5 per cent to over 1 per cent[15]), and only too often, the grief of losing a sick or undernourished child. AIDS, the scourge of the final decades of the twentieth century, has caused great ravages among men but also increasingly among women, who are not in a sufficiently strong position to refuse sexual relations or to force men to wear condoms. However, throughout the world, improvement in the health and health education of women – the ones who provide care and the instruments of modernity – has contributed to an improvement in the health of entire populations.

Childbirth increases the domestic workload of women. In rural areas, this work is traditionally carried out in addition to work in the fields (especially in Africa) and is time- and energy-consuming: fetching water or wood, grinding grain, and cooking. As happened in Africa, where

colonization and development of crops for export increased the burden on women and deprived them of the fruit of their labours (monetized by men), the situation of peasant women tended in the twentieth century to deteriorate in poor countries, even in independent states, and conventional forms of forced labour (to repay debt, for example, in Pakistan or India) persisted. Towns and cities everywhere attracted and continue to attract people, owing to the opportunities they offer, even as they destroy previous social links and ways of life and reveal stark inequalities. To a greater extent than domestic service – which became feminized in Africa in the twentieth century (from houseboy to ayah), and frequently led to the gross exploitation of younger and older girls from rural areas or distant countries (Filipino maids in the Middle East, for example) – it has been the so-called 'informal' labour activities that have enabled women, many as heads of household (up to 35 per cent of households in the Caribbean), to subsist and to achieve a certain level of independence. This has long been the case in certain towns in West Africa, where women sell at market what they produce, make or collect, or run the trade in food or craft items, locally and at times further afield. Today, many African cities survive thanks to unflagging and pitifully remunerated female labour. In the more urbanized and industrialized Latin America, as in South-East Asia, women are also employed as manual workers, supplying textiles or electronics industries 'relocated' from wealthy countries with cheap and dexterous labour, and sometimes taking up modern occupations in the tertiary sector. The well-known brands of clothing or sports goods brands sub-contract the manufacture of their products, which are made by young women or children for a pittance (less than one hundredth of the selling price), particularly in Indonesia, China, and Mexico, to the general indifference of most consumers in wealthy countries.

In developed countries, where women today make up 41 per cent of the working population (or occasionally more, as in France), work was and is a necessity for many. Although, women have always worked in agricultural societies and the poorest of them played a part in the industrial revolution, paid work outside the home as a source of independence represents a conquest of the last three decades of the twentieth century. This occurred after the slow democratization of the middle-class stereotype of the mother in the home, which reached its high point after the Second World War – an exception to this being the communist countries which always fostered women's work. At the same time, working women, who at the beginning of the century were mainly land and manual workers, for the most part became employees in the highly diversified and rapidly expanding tertiary sector. Like men, women benefited from the social gains of the century (labour legislation and protection against risks to life), but equality at work, constantly called for, was not achieved. At the end of the 1970s, the economic crisis that brought to an end the 30-year boom period begun in the wake of the Second World War maintained, reinstated or accentuated the disparities in employment and wages (women being most vulnerable to unemployment and the demands of flexibility), with the exception of the most highly educated, who benefited from a tendency towards egalitarianism, only to come up against what is known as the 'glass ceiling'.

## ACCESS TO KNOWLEDGE AND POWER: A CONSTRUCTIVE PATTERN OF CHANGE

Historically, access to learning has been based on segregation by class and sex: why teach the poorest individuals (condemned to the hardest manual labour) or girls destined to perform the domestic tasks learned from the women of the family? Why give them the same teaching in the same schools? In Europe and North America, illiteracy had been overcome – earlier in some places, later in others – by the end of the nineteenth century, as primary education became widespread. However, for a long time, there were fewer girls in secondary or higher education, where the doors of certain establishments were closed to them, or they were confined to specific courses that did not provide the same employment opportunities. Over the last thirty years in Europe, North America and the southern part of Latin America, women have become more numerous and successful in education and less prone to functional illiteracy. However, in developing countries, the 'education revolution' has been slow in coming and was very unevenly spread, except in socialist states such as Maoist China or Cuba under Castro, which rapidly and extensively provided both sexes with schooling. Girls, shunned by colonial schools, which often superimposed their own interpretation of female dependence, for a long time received less schooling than boys. The illiteracy rate among women (who today make up two-thirds of the world's billion illiterate adults) is still extremely high in the majority of African states (at times, as high as 90 per cent), and in countries such as India, Pakistan, Afghanistan, and Laos. However, there is a widespread consensus in favour of education among the international community, which provides aid to states at their request. This situation is changing rapidly for the younger generations. With a few exceptions – such as Afghanistan, where the Taliban closed girls' schools when they came to power in 1996, or African states affected by war or plagued by severe economic recession – an increasing number of girls (including in rural zones) are receiving a few years of schooling. This will have an impact on the future in many different ways, including an improvement in family health, decline in the fertility rate, and greater independence for women.

The issue of the gender bias and, even more importantly, the sexist content of textbooks and school curricula was first raised by feminists 30 years ago and was not solely the concern of wealthy countries. At every level, women's issues were rarely considered and their achievements (artistic, cultural and political) were ignored. This hampered the growth of awareness by girls of gender inequalities and stood as an obstacle to their identification with female role models. In all societies, the voices of women – painters, musicians, writers, discoverers, activists, female politicians – have always had more difficulty in making themselves heard, claiming universality, and being acknowledged. Since the foundation of the Nobel Prize in 1901, fewer than 30 women have won prizes, out of more than 600 individual awards. However, Nobel Peace Prizes were awarded to the Burmese Aung San Suu Kyi (Plate 53), in 1991, and to the Guatemalan Rigoberta Menchú, in 1992, and these recent nominations along with the cultural affirmation of women in wealthy countries and elsewhere, reflect the current pattern of change. A similar situation has also been noted in politics.

In traditional societies as in organized states, politics, the public domain *par excellence*, has traditionally been a male concern. In West Africa, where women, such as Ibo peasant women or tradeswomen in towns, enjoyed a certain level of autonomy through the management of their own business, politics became even more of a male preserve with the advent of colonization, which destroyed their unity and way of life and provoked revolts. In North America and Europe, the phenomenon was also exacerbated by the establishment of democracies that refused to grant to all women the privileges enjoyed by some. However, at the same time, this gave rise to suffragist organizations, which called for the right to vote and to be elected, in the name of the equality of all individuals and the qualities specific to women (Plate 54). The first state in the world to give women the status of citizens was New Zealand, in 1893, and the first European state to do so was Finland, in 1906. Almost everywhere, and particularly in France, where women acquired political rights in 1944, almost one century later than men (1848), resistance from male and political spheres was extremely strong – stronger than the resistance to the integration of the poorest sectors of society, although usually weaker than opposition to the integration of people of other ethnic origins. There were also numerous expedients, such as introducing the right to vote in stages, granting suffrage to some (such as soldiers' widows, female military personnel, mothers with several children) and barring others from it.

It was at the end of the 1950s, in the wake of decolonization, that the right of both men and women to vote and to be elected became widespread throughout the world (Plate 55). In 1959, Aoua Keita, a midwife and activist in Mali's Women's Democratic Assembly, became the first woman in French-speaking Africa to be elected to the Constituent assembly of her country.[16] With the exception of Kuwait, and on a world scale, going beyond the scope of T. H. Marshall's chronological model,[17] political equality was achieved from the 1970s onwards, before civil equality and before the acquisition of social rights. But this equality was limited, not only by the absence of real democracy in many countries, but also by the use women made of their rights and the difficulty they experienced in rising to positions of power within legislative or executive authorities. On the one hand, women, who for a long time were more inclined to abstain from voting and were more conservative than men, or who followed family opinion, needed time (sometimes several decades) before they voted in a truly autonomous way. Since the 1980s, in Germany, France and the United States, women have proven to be more progressive and hostile to any form of extremism. On the other hand, despite the success of outstanding female politicians, who, incidentally, have rarely supported the cause of women, executive or elected offices have remained male bastions. Nonetheless, we should mention certain women who were the political heirs of their fathers or husbands: Sirimavo R. D. Bandaranaike of Sri Lanka, the world's first female prime minister (1965–70 and 1971–77); Indira Gandhi, prime minister of India from 1966 to 1977 and from 1980 until her assassination in 1984; Corazón Aquino, the 'Madonna of the Philippines', who held office from 1986 to 1992; and Benazir Bhutto, the 'Queen of Pakistan', prime minister from 1988 to 1990 and then from 1993 to 1996. Moreover, there are also noteworthy self-made women: Golda Meir, the 'Grandmother of Israel' and prime

minister from 1969 to 1974 (Plate 56); and Margaret Thatcher, the 'Iron Lady', who governed the United Kingdom from 1979 to 1990.

In reality, only deliberate quota policies have made it possible to bring about any significant increase in the representation of women in parliaments. Such a policy was introduced in the 1980s by the Scandinavian nations, where women also rose to the highest executive offices (the former Norwegian prime minister, Gro Harlem Brundtland, became Director-General of WHO in 1998). Their example was followed over the next ten years by several states in Africa and Asia, including India, where one-third of seats on village or town councils were henceforth reserved for women, and by France, which committed itself to a strategy of *parité* (equal access by men and women). This is a positive pattern of change. However, looking beyond electoral politics, it is the 'empowerment' of women (the way in which they take charge over their lives) that will build the world of the twenty-first century. An uncertain world, but perhaps one in which there is more equality between the sexes, more sensitivity to wealth sharing, and more openness to the intermingling of spaces, powers and cultures. The twentieth century blazed the trail and showed that nothing can ever be taken for granted. It is now for tomorrow's women and men to press on tenaciously and with vigilance.

## NOTES

1.   See the proceedings of the 17th (Madrid), 18th (Montreal) and 19th (Oslo) International Congresses of Historical Sciences.

2.   Illustrated, e.g., by Catherine Coquery-Vidrovitch, author of numerous works on Africa, in French and English.

3.   I presented this thesis in the volume devoted to the twentieth century in the collection entitled *Histoire des femmes en Occident*, Plon, Paris, 1992.

4.   E. C. Dubois and V. L. Ruiz (eds), *Unequal Sisters: A Multicultural Reader in United States Women's History*, Routledge, New York and London, 1990 and 1994.

5.   In France, e.g., at the time of the Liberation in 1945. See F. Virgili, *La France 'virile': Des femmes tondues à la libération*, Payot, Paris, 2000.

6.   Numerous reports have been compiled by NGOs, UNESCO and the United Nations. See articles by V. Nahum-Grappe (in French).

7.   See C. A. Presley, *Kikuyu Women, the Mau Mau Rebellion and Social Change in Kenya*, Westview Press, Boulder, CO, 1992.

8.   See F. Héritier, *Masculin/féminin, la pensée de la différence*, Odile Jacob, Paris, 1996.

9.   For example, from the point of view of the general population and particularly of the situation of women, Indonesia is very different from Iran or Afghanistan, despite the fact that these three countries are Muslim. Similarly, the situation in Catholic countries varies.

10.   H. Fukumoto, *Femmes à l'aube du Japon moderne*, Des femmes, Paris, 1997.

11.   Many articles were published in journals at the time of the international conferences on women. The following

article in French gives an overall picture: G. Procacci and M. G. Rossili, 'La construction de l'égalité dans l'action des organisations internationals', in C. Fauré (ed.), *Encyclopédie politique historique et historique des femmes*, PUF, Paris, 1997, pp. 827–59.

12. European institutions have also implemented the principle of 'mainstreaming'.

13. See J. Fischer, *Mothers of the Disappeared*, Zed Books, London, 1989, or E. Sarner, *Mères et 'folles' sur la place de Mai: Argentine 1976–2000*, Desclée de Brouwer, Paris, 2000.

14. Demographic transition is defined by demographers as a pivotal period between the traditional demographic regime (high birth and death rate) and the modern demographic regime (both rates are low); during this period, the death rate falls before the birth rate and population growth is strong.

15. Every year throughout the world, over 500,000 women, of which 30 per cent are adolescent, die as a result of pregnancy or childbirth, over 100,000 as a result of abortions carried out in poor conditions.

16. See her memoirs: A. Keita, *La vie d'Aoua Keita racontée par elle-même*, Présence Africaine, Paris, 1975.

17. T. H. Marshall, *Citizenship and Social Class*, Cambridge University Press, 1950. According to Marshall's model, which corresponds to the British situation, rights are obtained in the following order: civil, political, social.

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# 9

## YOUTH

### *François Dubet*

**INTRODUCTION**

The way in which youth is experienced varies considerably according to the historical and social context. The new manner of perceiving and understanding youth that has evolved in recent years is closely associated with a longer period of education, the weakening of social structures and the increased interaction between the mass youth culture and the mass youth market. Paradoxically, young people are most independent and most highly thought of in Western societies, precisely where they are the least numerous.

The advent of the modern era has given particular significance to youth. In societies dominated by social change, young people have been identified not only with a better future but with decadence as well. The way youth is defined often owes more to ideology and the imagination than to reality. As most of the fears and aspirations of a society are projected on its youth, young people as a category must be considered in a historical perspective, and their conduct and behaviour patterns studied in light of the phases and stages of social development.

**Adolescence and youth**

Youth is both a bio-psychological concept – in which case it is preferable to speak of adolescence – and a social fact (youth proper).

Adolescence is a period of physical, psychological, emotional and cognitive maturation. It is the transitional stage between childhood and adulthood, between the age of dependence and that of the entry into an autonomous and responsible adult state. Children in all known societies have to face adolescence, and most societies consider it a period of uncertainty and unease during which individuals experience an identity crisis, often stemming from the contrast between their intellectual and physical abilities, on the one hand, and their status in society as minors, on the other. Adolescents naturally sever their ties of loyalty and obedience to their elders and begin claiming a new degree of autonomy. Through attachment to their peers, they discover their power and their independence. In psychoanalytical

terms, this stage of life is considered to correspond to an 'Oedipal reactivation' that disrupts identity and self-image. In most traditional societies, adolescence is therefore delimited and punctuated by rites of passage marking the transition into adulthood. Rites of passage are ceremonies that transform adolescent boys and girls into adults. The aim of such traditions as the medieval ceremonies associated with chivalry, the changing of family names, and female initiation rites that reveal adult secrets, is to reduce and control the period of adolescence and to ensure a harmonious passage to a pre-defined adult state with distinct sexual and work roles. Quite often, traditional societies tolerate some excesses by young people when they are reassured they will not destabilize the social order.

The notion of youth, in the strict sense of the term, comes to the fore when the intermediary stage between childhood and adulthood is drawn-out and dissociated from adolescence proper. In modern societies, where one is considered a young person up to the age of about 25, the concept of youth is quite extensive because individuals are no longer considered in terms of their psychobiological situation but in terms of their social situation. A young adult of one hundred years ago, for example, would today be considered a young person. The age at which a person starts to work or marries is thus advancing as societies develop. Youth is a function of modernity because this lengthening of an intermediary age in the life cycle is due to economic and social factors. In modern societies, the period of formal education has grown longer and longer, and in many societies, half the population pursues an education beyond the age of 20. In fact, in many countries, anyone below 30 years of age is considered to be 'young'. Furthermore, societies of 'ascription' have given way to societies of 'achievement', the status of individuals being no longer wholly inherited, and mapped out by a strict destiny, but acquired by the individual during that long formative period called youth. In modern societies, people do not become doctors or workers because they are sons or daughters of doctors or workers, but because they have acquired the necessary qualifications. Even though opportunities for acquiring a particular status are largely inegalitarian, it is nonetheless true that an individual constructs his or her own adult status. The same applies to the choice of husband or

wife. With the decline of arranged marriages, each person forms his or her family within objective social determinations. There are thus two contrasting dimensions that characterize youth – uncertainty and the need to project oneself into the future. For demographic and social reasons, today's youth is constantly evolving in those societies engaged in a process of development, as can be seen in the internationalization of youth culture and the student demonstrations in China, Korea, Japan and Latin America. Youth is thus beginning to extend beyond the bounds of its modern Western framework.

The history of the sociology of youth coincides with the evolution of youth itself. Indeed, this branch of sociology has grown and changed as the period of youth and preparation for adult life has grown longer, with the postponement and growing uncertainty of entry into active life and with the proliferation of youth and training policies. The sociology of youth is, however, very often linked with related topics, such as youth and delinquency, youth and education, youth and work, youth and culture, youth and politics, youth and the family, or youth and mobility.

The general survey by O. Galland,[1] which offers a very clear and well-documented account of the sociology of youth, follows this principle, thereby reflecting the multifarious experience of youth. With the exception of the anthropological problem of adolescence, the sociology of youth encompasses all the branches of sociology that deal with youth. The subject of youth sociology, i.e. relationships between the generations, accounts for only a fraction of the studies. Youth is perceived rather as a 'condition' defined by the nature of the fields, institutions and policies through which it can be studied.

Several problems and images of youth can be portrayed, depending on the general context in which they develop. In as much as youth is associated with modernity and development, we must consider those stages.

**The advent of industrial societies**

For a long time, youth was a privilege of the dominant classes, which had the luxury of deferring entry into the work world and indulging in a long period of education and training. Youth-related problems emerged with the advent of industrial society and modern nations. The 1930s were marked, in the United States in particular, by some major studies relating to gangs and urban marginality. Youth emerged as one of the subjects of urban sociology, that is, the sociology of the processes of crisis and change triggered by modernization. Youth provided the litmus test for those mechanisms because the immigrant groups that started to penetrate American culture and society were often quite young. Many famous surveys[2] constructed models for the interpretation of young people's behaviour in terms of social disorganization, migratory changes and urban life. Gangs and the sociability of youth in big cities were forms of solidarity and provided resources that enabled young people to survive and to adopt an identity when caught between traditional cultures and modern societies. Many studies on immigrant youth often unwittingly reflect this tradition and perspective. It must be borne in mind that many young people today are faced with the ordeals of social acculturation, particularly the young Arabs, Africans, Caribbeans, and Latinos in Europe and North America. The capacity of

integration within industrial societies and their institutions is evaluated with respect to young people. It is also in connection with youth that questions arise as to how one becomes English, American, Canadian, or French or whether modern societies are civilizations of integration or classes of minorities. In the first case, the gang is considered to be a step towards integration; in the second, it is perceived as the expression of a community that lives outside of the predominant society.

In general, sociologists observe a conflict between the high potential for cultural assimilation resulting from the pressure of mass culture and the low level of economic integration due to practices of segregation. In poor inner city areas of English-speaking countries or in destitute Latin American neighbourhoods, revolt is growing among young people who want to integrate but who cannot be absorbed by the economies of Western societies.

Many of the problems of youth are related to development. Youth involved in urban violence and drugs are often seen as victims of unemployment and other social problems. In most developed societies, youth policies have evolved into social and training programmes that attempt to demonstrate how young people can be productively integrated and trained where previous methods have proven obsolete. However fascinating the study of post-modernity in post-industrial societies may be, it should not be forgotten that much of humanity is still experiencing problems related to their entry into urban industrial society.

## YOUTH, MASS SOCIETY AND YOUTH CULTURE

Youth only really came to the fore as a specific field of sociological study in the 1950s and 1960s, an era marked by the 'rise of youth' and by the appearance, in all Western countries, of a new type of young people from the educated middle classes. During this period, several phenomena emerged such as the lengthening of the period of youth and the youth culture as a sign of cultural modernity. In fact, to be modern was to be 'young'. The work of T. Parsons, S. N. Eisenstadt and E. H. Erikson illustrates the thinking at that time.[3] These specialists stressed the importance of a period of life in which one's personality becomes more autonomous and more detached from old values. That is why youth is always perceived as 'dangerous' in varying degrees by broad sectors of society. Once again, youth was identified with modernity, that of the middle classes, who were exposed to the mass media, upheld the values of personal independence and self-fulfilment and devoted many years to their education. Youth culture appeared to define the 'adolescent society'[4] and imposed its own collective identity, distinct from that of adults, during a period fraught with intergenerational conflict. Youth culture was considered to be a form of socialization at an age of life marked by ambivalence towards the law and the postponement of adult commitments. It was a way of managing the strains and 'crises' of prolonged youth in the modern world. In countries with shrinking populations, however, the image of youth remained globally positive.

Since the release of the first rock and roll recordings, youth culture has become one of the essential features of the cultural landscape. The vast majority of young people form a part of this culture, which distinguishes individuals

according to their styles, tastes, clothing, etc. To belong to a specific generation is an essential element of identity. To a large extent, modern youth culture constitutes the first world culture. Elvis Presley, the Beatles (Plate 57), the Rolling Stones, among others, became the stars of a universal culture widespread in Western countries but also throughout the former communist countries of Eastern Europe and the Third World. Of course, this culture is not homogeneous because it is adapted to local contexts leading to the creation of specific musical styles, like raï in Arab countries. It is also highly diversified from one social group to another, each group being distinguished by its particular tastes and passions. Not all young people dress in the same way, but a general style of dress and consumption has become the rule among youth worldwide. In just a few decades, youth fashion has developed into a large economic and cultural market. Tens of millions of young people listen to rock, hundreds of thousands play it themselves in some capacity, and this mass culture has become a means of expression associated with the sentiments and experiences of those actively involved in society. It is a culture that was optimistic and hedonistic in the 1960s, marked by protest in the 1970s, and desperate and violent in the 1980s. Youth culture is not only the result of the commercial strategies of large corporations, but also a form of autonomous expression, which explains why authoritarian regimes have always viewed it with distrust. Youth culture has been associated with all the major events of the last 40 years.

The sociology of juvenile delinquency also changed as youth was becoming established as a collective mass experience. The theory of deviance developed by Robert Merton greatly influenced sociologists of the period. Merton considered juvenile delinquency the outcome of tension between a mass democratic culture, which required each person to be fulfilled and to succeed, and a social structure that locked individuals into their existing affiliations and offered them no opportunity to change their lives. Youth problems were thus one of the most striking manifestations of the conflict between social inequality and the democratic ideal. Therefore, the sociology of youth could be defined as the analysis of the encounters between youth and social structures related to opportunity.[5] Juvenile delinquency, as epitomized by Hell's Angels, Rockers, Soviet 'hooligans' and Teddy Boys, was not seen as an effect of social disorganization but as the outcome of contact between a rigid social structure, especially for the working class, and a mass culture that aspired to middle-class lifestyles. In France, the advent of youth as a mass phenomenon in the 1960s led to a number of studies, including E. Morin's well-known articles (1966), on youth culture. Morin's work must be compared with more structural approaches that challenged the image of a mass youth culture from the point of view of class differences. This debate lay at the heart of the sociology of youth during the period of cultural modernization, as embodied by the 'teenager'.

**Can youth be considered a social movement?**

May 1968 in Paris (Plate 58) and the protest movements on American campuses gave a new twist to the study of youth by associating it with the sociology of social movements and change. Were young people new players on the cultural and social scene? The image of young people

adulating the consumer society was replaced by that of the critical, pugnacious youth of the great demonstrations against the Vietnam War, the youth of the Woodstock counter-culture appealing for brotherhood and a return to nature (Plate 59), and the politicized radical youth of Germany, France and Italy who dominated the universities, the cradles of the new social movements of the 1980s. The rock concerts and rallies that sometimes served to express opposition to authoritarian regimes are noteworthy. For a few years, the sociology of youth was the sociology of counter-culture and the sociology of student movements. Scholars such as Margaret Mead, K. Keniston, A. Touraine and G. Vincent engaged in these types of inquiry.[6] Two major theories predominated in Western societies: youth as a social force able to transform the culture of industrial societies, and youth as a new player on the political stage, capable of taking up the torch of protest abandoned by the worker's movement, as suggested by Marcuse. The first hypothesis was advanced by Margaret Mead, who claimed that because of youth's uncertainty and low level of integration, it was building new utopias distinct from the values of capitalist industrial societies that would eventually lead to post-materialist values. The second theory was embraced by many left wing movements, some of which slid into terrorism, particularly in Germany and Italy.

However, we must point out the following paradox: while youth has become an essential element of contemporary societies, the youth movement seems to be relatively unorganized. The major cultural, religious or political youth movements that carried great weight until the 1950s are now unable to attract great numbers of young people. Should we regret or welcome this evolution? On the one hand, it can be viewed as a positive development, because many youth movements used to be associated with dictatorial parties, making them not so much youth movements as manipulated masses of youth. Today's young people feel both the weight and attraction of modernity, and solitude is perhaps the price to be paid for individual autonomy. On the other hand, this evolution may be regrettable because contemporary societies allow one to be 'alone in a crowd', and many young people suffer from isolation and the absence of moral standards. Suicide is a major cause of death among young people.

**THE CRISIS YEARS**

After the years of consumerism and protest came the crisis years, which primarily affected young people in the rapidly changing systems of education and the work market.

The time frame of youth has continued to grow longer in all Western societies in degrees that vary mainly according to the importance attached to higher education. For positive reasons associated with the recognition of young people's autonomy, and for negative reasons linked to the difficulty of starting work in a stable way, youth nowadays extends well beyond the period of adolescence. In this connection, it is possible to speak of the 'juvenilization' of modern societies, and a longer period of youth has ceased to be the preserve of the middle classes and of students alone. Youth has been constantly accorded increasing value, and this has affected the definitions of the various stages of life. The growing ascendancy of the education system is largely associated with this phenomenon. The historical perspective highlights

the growth of youth as a mass phenomenon and the weakening of rites of passage or the emergence of substitute rites that can no longer be considered fully genuine. Youth is valued. It is a time of personal experimentation, of living together as a couple, of having several jobs and a measure of freedom associated with the 'irresponsibility' of youth. However, owing to unemployment, job instability, and the declining value of a university degree in terms of earning-power, youth has also become extended. Indeed, it is increasingly difficult to become an adult in the modern world. In recent years, the study of youth has focused on examining the ways and means of entering adulthood and finding one's first job. The studies have often been associated with the evaluation of social policies on youth and in particular with the following up of cohorts of young people who have been through various training or qualifying courses. Many studies have highlighted the new stages of this adolescent moratorium, with the new phases of family cohabitation and frequent job change.[7] Other phenomena revealed by studies are late marriages and postponement of births. Dependence on institutions and the family has also increased, contributing to the 'blurring' of relations between generations. Many young people are in fact adults who cannot reach adulthood. In countries with greatly developed higher education such as the United States and France, the time spent studying is increasingly extended so that the level of academic qualification will afford protection from unemployment or guarantee a status that is considered respectable. In certain cases, a sort of student proletariat is developing that enrols in a university to prepare for a place in the unemployment queues. In that regard, national situations vary greatly, but unemployment rates for young people (like for women and even more so for girls) are extremely high. Many young people feel that their society is closing the door on them and forcing them to stay young.

The sociology of youth cannot be reviewed without reference to work on the political socialization of young people.[8] Political affiliation hardly occurs automatically. The nature of youth experience itself affects political choices. It has been noted that young people change their electoral choices frequently before adopting a stabile political position. Clearly there is no homogeneous youth vote since young people are a mass of individuals. Withdrawal from politics does not necessarily imply a decline in group action, as evidenced by studies of movements among high school students in France, who are still very highly motivated to act but whose commitment seems to be based more on values than on ideology.[9] While youth commitment is fleeting and no longer seems to be controlled by a hyper-politicized youth intelligentsia, other forms of involvement in collective action seem to be developing on the basis of more personal moral problems. The sociology of youth is associated with the study of post-materialist cultures as evidenced by young people's sensitivity to humanitarian and ecological causes, and to combating AIDS. On the other hand, young people can be violent in expressing their fear of traditional and national communities being destroyed by modernization and the globalization of trade and communication. They can become skinheads and adopt far-right ideologies to varying degrees.

The rise in the problems of marginalization has led to a wealth of research on the most disadvantaged young people, those belonging to the underclass, especially young people of immigrant origin. In collective representations, they embody the principal difficulties engendered by economic crises, urban transformations, and the effects of mass education. Generally speaking, there are two main views on the subject. The anthropological approach emphasizes the processes of acculturation and cultural crisis encountered by young people from immigrant families. This has given rise to the theme of 'ethnicity' and the assertion of community-based cultural and social identities in the very heart of modern societies. As these young people cannot become part of society, they retreat into a subculture of identity and conflict, as exemplified by rap and reggae. The opposing view emphasizes the strains engendered by the 'conflicts' between the considerable cultural assimilation of the young immigrants and the high level of social exclusion to which they are subjected. This view stresses the aspects of anger and revolt among the young people of immigrant origin and the formation of 'marginality', which is appearing as a new form of popular awareness as the traditional working-class world declines.

## YOUTH AROUND THE WORLD

The situation outlined above only arises in industrial or post-industrial developed societies. In other regions of the world, young people make up the majority of the population. Yet youth does not have the same implications for all of them. Some young people, who belong to the middle and upper classes, identify with Western youth; they try to look and behave like them and often experience identical problems, notably those associated with longer schooling. However, the vast majority have a completely different experience of youth. They must work from an early age and are cramped by structures and traditions that severely limit their autonomy, particularly regarding the choice of a spouse, cultural freedom, and the ability to innovate. These young people are actually deprived of their youth. They often constitute a proletariat within the proletariat (Plate 60); increasingly subject to unbridled economic exploitation, they struggle for survival and sometimes find themselves in a situation of such dependence and poverty that they have only their bodies to sell.

Let us not lose sight of the fact that the emergence of youth as an independent experience remains largely the 'privilege' of sufficiently developed societies. For other young people, youth is either only a short stage in their lives or a time when their exclusion from society is accentuated.

## CONCLUSION

The last two decades of the twentieth century have therefore witnessed a reversal in the optimism of the years of growth and of personal and collective liberation. The 'modern' youth of the 1960s and the 'critical' youth of the subsequent period of revolt are being replaced by youth in crisis. The sociology of youth is associated with the sociology of deviance and urban sociology and is becoming the sociology of social problems much more than the sociology of cultural and social change.

The sociology of youth has developed considerably and no brief review can do justice to the work published in this field. The mechanics of entry into active life and the sociology

of the various age groups are of great interest to researchers; our understanding of these subjects is being built up gradually. Age and gender divisions and cultural definitions of identity will assume greater significance as traditional legal barriers rapidly become unstable and as the period of youth continues to grow longer. At the same time, however, youth is becoming a sort of central figure in the social experience, for, as its borders become blurred, the characteristics of legal uncertainty and the characteristics of 'passage' are extending beyond the youth experience itself. Adulthood is ceasing to be the only benchmark.

## NOTES

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2. F. Thrasher, *The Gang*, Chicago, IL, 1927; W. F. Whyte, *Street Corner Society*, Chicago, IL, 1943.
3. T. Parsons, 'Youth in the Context of American Society', in E. H. Erikson (ed.), *Youth: Change and Challenge*, London and New York, 1963, pp. 96–119; S. N. Eisenstadt, *From Generation to Generation*, Glencoe, IL, 1956; E. H. Erikson, *Adolescence et crise*, Paris, 1972.
4. J. S. Coleman, *The Adolescent Society*, New York, 1961.
5. R. A. Cloward and L. E. L. Ohlin, *Delinquency and Opportunity*, New York, 1960.
6. M. Mead, *Le fossé des générations*, Paris, 1971; K. Keniston, *The Uncommitted: Alienated Youth in American Society*, New York, 1965; K. Keniston, *Young Radicals*, New York, 1968; A. Touraine, *Le Mouvement de Mai ou le communisme utopique*, Paris, 1968 ; G. Vincent, *Le peuple lycéen*, Paris, 1974.
7. O. Galland, 'Précarité et entrées dans la vie', in *Revue française de sociologie*, Vol. XXV, 1984, pp. 49–66.
8. A. Percheron, 'Peut-on encore parler d'héritage politique en 1989?', in Y. Meny (ed.), *Idéologies, partis politiques et groupes sociaux*, Paris, 1989, pp. 157–74.
9. F. Dubet, *Les lycéens*, Paris, 1991; D. Lapeyronnie and J. L. Marie, *Campus blues*, Paris, 1992.

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# 10

## OLDER GENERATIONS

*Tampalawela Dhammaratana*

### INTRODUCTION

With two world wars and numerous regional wars and internal armed conflicts, the twentieth century witnessed unprecedented human misery, deprivation, displacement of people, economic disaster and increased poverty. In Europe and Japan, the loss of several millions of youth created a serious imbalance in the work force. As the dependency ratio (an indicator of the age composition of the active vs. the ageing population) increased, Western countries encouraged massive immigration of an active labour force from the developing world. By the mid-1960s and 1970s, however, the increase in agricultural productivity, the improvement of transportation, the development of national political stability, social and economic change, and the extraordinary achievements of science and technology ushered in a period of economic and social consolidation. Resulting improvements in nutrition and health care increased the life expectancy and decreased the death rate throughout the world. Simultaneously, progress in education, improvements in the position of women, as well as factors such as modernization, increasing family cost, urbanization and industrialization, dramatically reduced fertility. The world faced a spectacular increase in the 'third age' or senior population. Ageing and the elderly became matters of universal concern.

Three specific areas regarding older persons are dealt with in this chapter: ageing as a global social phenomenon; older persons and value systems; a new perspective of the international community.

### A GLOBAL SOCIAL PHENOMENON

In 1950, there were 200 million people over the age of 60 in the world. By 1975, the number had increased to 350 million, and reached 600 million in 2002. Today, one out of every ten people is over sixty. The rapid growth of the older generations had significant consequences in economic, social, cultural and political spheres. The older generations proliferated both in the poorest as well as the richest countries of the planet, but not evenly. One out of every five Europeans, in comparison to one out of every twenty Africans, is at least 60 years old. One million men and women reach the age of 60 every month, and 80 per cent are from developing nations. Approximately 53 per cent live in Asia, 25 per cent in Europe and 22 per cent in the rest of the world. Japan has recorded phenomenal growth. In general, 55 per cent of the aged population are women. Moreover, 65 per cent of the oldest segment of the senior population are women.[1] In industrialized countries, 74 per cent of ageing people live in urban areas, while in developing countries the majority live in villages or remote areas with only 37 per cent in urban areas. One per cent of the total human population is over 80 years of age. Recent United Nations research reveals that six countries – China, United States, India, Japan, Germany, and the Russian Federation – account for 54 per cent of the total number of those aged 80 years or over.[2] The third category of the ageing populations, i.e., people over 101 years, also registered an overall increase. The quality of life of older persons has deteriorated in many parts of the world over the past 15 years. This situation is worse in the developing countries. Several millions of elderly people lack economic and social support to afford their basic human needs. The majority of elderly people live below the poverty level. Many have been excluded from society and neglected by their families. Beginning in the 1950s, the age structure of industrialized countries became younger, and the substantial decline in fertility reversed the trend of population growth. Public policies aimed to increase the birth rate have failed to bring about marked change. The dependency rate has increased to a considerable level. The member countries of the OECD (Organisation for Economic Co-operation and Development) as well as other European countries provide elderly people with substantial advantages and services after retirement. These include pension benefits, social security, health care and housing. Yet elderly people in these countries suffer from psychological problems resulting from isolation and lack of emotional support from their families. The number of suicides committed by elderly persons seems to be higher than in developing countries. Newly industrialized countries and areas such as Hong Kong, Singapore, the Republic of Korea and Taiwan, parts of Latin America and

the Caribbean region, and the oil exporting nations such as the United Arab Emirates, Kuwait, Saudi Arabia and Libyan Arab Jamahiriya have witnessed a considerable increase in the ageing population.[3] In many respects, the situation is similar to that of industrialized countries. Life expectancy has increased as a result of modern services, health care and other support systems. In such countries, economic support from pension benefits, provident funds and other social security programmes is available to only a very small proportion of the older population. Yet the elderly still have to contribute to their families by way of babysitting and housekeeping, while the younger generation goes to work. Such tasks carried out by older people are not considered to be of any economic value, but the older generations are nonetheless regarded as an asset to the family.

The situation of elderly people in developing countries is considerably worse than in developed regions. As no pension or social security benefits are available to them, despite their long involvement in agricultural production, older persons often become a burden to their families. However, increasing urbanization and inter-migration have changed traditional family life. As young married women and men migrate to urban areas for employment, the elderly parents are compelled to live alone with no one to care for them. Conditions vary in different cultures. In spite of rapid modernization in Latin American countries, the family relationship with elderly people still remains very strong, even though contact between different generations in the same household leads to a low level of satisfaction for the elderly.[4] In Asia, India is unique in that the joint family system wherein families of male children continue to live with the aged parents, treating the father as patriarch, enables the elderly parents to exercise control over family resources. The newly independent countries, especially those of the former Soviet Union, encounter considerable problems in matters related to the economy, social welfare, politics, inflation, immigration and population, including a rapid increase in the number of older persons. In such situations of transition, job seekers move from rural areas to large urban centres. Many others immigrate to developed countries, legally or illegally, to find economic security in order to help their families, including older parents.[5] This internal and external migration has created considerable problems as regards accommodation and other facilities especially in main cities. More older people in transition countries live with their families, than those from industrialized countries. Yet they also encounter problems of loneliness, abandonment and dissatisfaction with economic conditions. They also have very limited access to social security and other benefits of social well-being. Unprecedented longevity is a sign of prosperity of world nations. It has repercussions, however, firstly as regards economic growth, savings, investment and labour force, secondly, social affairs, and thirdly, political affairs such as migration and refugee problems. Ageing populations constitute a burden on the active labour force. According to the International Labour Organization (ILO), the ageing labour force's participation rate is much higher in developing countries of Asia, Africa, and Latin America and the Caribbean than in the developed countries of Europe and North America. The decline in participation affects national per capita income, while increasing expenditure on social security and other social benefits. In developed countries, people spend a longer period in education, begin their professional careers later in life, work for a shorter time and receive retirement benefits for a longer period. The main economic and social implications of an ageing population are the burdens of economic dependency and the non-recognition of its potential as a resource for development. The twentieth century has witnessed a marked improvement in mobilizing the elderly people as a social asset.

The experience of ancient cultures in which the ageing population had a significant educational, cultural and spiritual role to play in society has been evaluated in a favourable light. Many societies have also clearly recognized the desirable involvement of grandparents in early childhood care and education, thus relieving the economically active parents to pursue productive enterprises. Such a transformation of roles has been advocated not merely for economic effectiveness but also for the invaluable ethical and spiritual considerations in favour of transgenerational transmission of wisdom and values. If one wishes to call the twentieth century the era of the recognition of older generations, it is because of the awareness of the important role that the elderly population can play in overall social development. In traditional society, the family, recognized as a basic social unit, lived together, and was composed of grandparents, parents, children, grandchildren and great-grandchildren. The members of the family maintained respect, duties, and obedience towards elders. The ties between the old and new generations constituted the cement that held the social edifice together. Like other faiths, Buddhism teaches us that 'for one who frequently honours and respects elders, four worldly rewards (age, beauty, happiness and strength) increase'. Chinese culture – influenced by Confucianism, Taoism and Buddhism – assigns a position of great veneration to the elderly (Plate 61). In the third century BC, the preservation of ethical, cultural, and religious values and respecting aged people was highly praised by the Buddhist Emperor Asoka of India. The Edicts of Asoka highlight the duties of children towards their parents. For example, Rock Edict (Girnar) III states: 'meritorious is obedience to mother and father', (*sādhu mātari ca pitari ca sūsūsa*), and Edict XIII advises: 'develop obedience to elders' (*gurunā suśrusā*). The *Aguttaranikāya* records that families in which the parents are highly respected deserve approval; such families are declared to be of the Brahman rank *sabrahmakāni*, together with the early great teachers, *sapubbacariyakāni*, and worthy of offerings (*āhuneyya*). In recent times, due to modernism, globalization, urbanization and immigration, family ethics have deteriorated, resulting in an inevitable generation gap between the old and younger generations. Throughout the world, there is a growing awareness that the ancient value systems, which promote the mobilization of the ageing population into active participation, should be revived in society.

## OLDER GENERATIONS AND VALUE SYSTEMS

Elderly people have been honoured by generations as transmitters of a universal cultural heritage for the benefit of humanity in the form of popular and traditional expression, performance, language, customs, music, ritual and traditional knowledge, art, craftwork and wisdom

(Plate 62). Deference to elders is in many instances attributed not only to respect for old age, but also for recognition of their valuable accomplishment in preserving different cultural values and experiences over the centuries. Conscious efforts have been made to preserve the knowledge and skills transmitted by the elderly. In the latter part of the twentieth century, UNESCO launched an important programme pertaining to the study and recording of the so-called intangible heritage in countries with deeply rooted oral traditions. The stirring and often-used quote 'when an old man dies an entire library is lost forever' effectively illustrated the importance of such activities.

Older generations of the Semeiskie people in the Transbaikal region of Russia, for example, possess a cultural tradition derived from a pre-seventeenth-century orthodox cult. The Semeiskie culture maintains moral principles, traditional dress, songs and traditional oral practices with the direct involvement of the elderly population. In Africa, there are many ethnic communities that have preserved extremely important cultural activities. In Benin a well-known performance called Gelede by the Yoruba-nago and other communities has been revived and takes place every year just after the harvest season and during droughts and epidemics. The Gelede performance combines the use of masks and songs in native languages, to recall the myths and the history of the Yoruba-nago culture and its people. The awareness of the role of the older generations contributed to its revival.

The well-known *Nātya Sāstra* of India, which has been transmitted by older generations over many centuries, is a vehicle of incomparable cultural, social, educational and religious values. The *Rāma Līlā*, a famous classical drama, is annually performed in practically every village in northern India. Elderly people preserve the tradition. The same is true of the *Kutiyattam*, a Sanskrit drama performed in Kerala in southern India.

In Ecuador and Peru, the Zápara people have developed an oral culture that reflects a particularly rich understanding of their natural environment. This distinctive cultural tradition is expressed through their cosmology and mythology as well as their rituals, artistic practices and language.

The Korean Royal Ancestral Rite represents an outstanding component of the world's cultural diversity. During the performance of this cultural and ritual practice, an important place is given to songs, dance, and traditional ritual music.

The Mystery Play of Elche in Spain is a sacred musical drama that commemorates the death, the assumption and the crowning of the Virgin Mary. This unique religious celebration from the mid-fifteenth century offers living testimony to the religious performances of the Middle Ages in Europe and to a Christian cult of extraordinary cultural value.

The Kandy Perahara in Sri Lanka recalls the island's 2,000-year-old Buddhist and Hindu cultural heritage. This celebration is a unique pageant in which several hundred elephants and thousands of traditional dancers participate and showcase Sri Lankan artistic heritage. In all these cultural activities, older generations, with leisure to pursue cultural activities, have acted as the principal proponents and promoters. The twentieth century has also seen the recognition of the role of the elderly in the preservation and transmission of indigenous knowledge, safeguarded by our

ancestors for the benefit of humanity. Apart from ethical and religious lore, such knowledge includes hitherto unrecorded information on medicine, forgotten technologies and many other kinds of know-how. As custodians of such rare knowledge and skills, elderly people have made significant contributions. The older generations have also played an important role in the evolution of social values in the process of transformation from traditional to modern societies. The experience, knowledge and guidance of older people have always been great assets in this process. Their indisputable authority has been exercised in the traditional family structure, especially in Asia, Africa and some other countries as regards important internal and external family affairs. They have been respected by the family members for their wise guidance. Moreover, the elderly have always participated in religious, cultural or social celebrations as guests of honour and they continue to play an important role as leaders in communal life. As those who attempted to foster modern development have realized, no progress in modernization could be made without the participation of the older generations. This factor largely accounts for the success of many development initiatives in Asia, Africa and Latin America.

## A NEW PERSPECTIVE OF THE INTERNATIONAL COMMUNITY

The international community has been in the forefront in raising awareness of the importance of older generations. In 1948, as the first step, the United Nations General Assembly adopted a resolution concerning a draft declaration on the rights and position of older persons. In December 1969, the General Assembly included in the Universal Declaration of Human Rights the need to protect and assure the rights and social welfare of the aged. In 1973, the United Nations General Assembly adopted Resolution 3137 (XXVIII) entitled: 'Questions of the elderly and the aged'. On this occasion, the subject was studied by the United Nations specialized agencies, in particular by ILO, WHO, UNESCO and the United Nations Food and Agricultural Organization (FAO). In 1974, the World Population Plan of Action adopted by the World Population Conference urged member states to take into account the problem of the aged in elaborating their national development policies. In 1977, the United Nations Economic and Social Council and the General Assembly dealt with the subject of the elderly, and a resolution was adopted inviting the member states to a 'World Assembly on Ageing'. One year later, in the course of the thirty-third session of the General Assembly, Resolution 33/52 of 14 December 1978 paved the way for the Vienna World Assembly on Ageing in 1982. This very successful convention launched an International Action Plan aiming at creating opportunities for the elderly in the fields of economics, culture, education, health care and security. The Vienna Plan of Action contributed to making member states aware of the challenges and issues related to the elderly and demonstrated the international community's commitment to the ageing problem: 'The Plan of Action should … be considered an integral component of the major international, regional and national strategies and programmes formulated in response to important world problems and needs. Its primary aims are to strengthen the capacities of countries to deal effectively

with the ageing of their populations and with the special concerns and needs of their elderly, and to promote an appropriate international response to the issues of ageing through action for the establishment of the new international economic order and increased international technical co-operation, particularly among the developing countries themselves'.[6]

Since the Vienna Convention, the world has seen a dramatic change for the better in national programmes for elderly people. In 2002, on the occasion of the twentieth anniversary of the Vienna Plan of Action, the second Convention on Ageing in Madrid adopted a new International Plan of Action on Ageing. After a very successful five-day convention, the member states agreed on a political declaration comprising 17 articles. The commitment of the member states on the ageing problem is stated as follows: 'We, the representatives of Governments meeting at this second World Assembly on Ageing in Madrid, Spain, have decided to adopt an International Plan of Action on Ageing 2002, to respond to the opportunities and challenges of population ageing in the twenty-first century and promote the development of a society for all ages. In the context of this Plan of Action, we are committed to actions at all levels, including national and international levels, on three priority directions: older persons and development; advancing health and well-being into old age; and, ensuring enabling and supportive environments'.[7] The International Plan of Action on Ageing in 2002 reiterates the need for Member States to change policies, attitudes and practices regarding ageing in their respective countries in all sectors to enable older persons to contribute to development and to participate within their families and communities in a respectful and secure environment. It is hoped that the implementation of these decisions will result in meeting all challenges of the older generations and establishing a society where older persons are enabled to age with dignity and participate in development activities as full citizens at the dawn of the new millennium.

## CONCLUSION

The ageing generations occupy a considerable place in modern society and government and international agencies. They are engaged in politics, interacting in the globalization of education, culture, communication, technology and the economy. The increasing dependency ratio would appear to contribute to the perception of the elderly as a burden to the working society. Since 1982, the situation has begun to change in a positive way. Governments and people in general have become increasingly aware of elderly people as a social asset. Their knowledge and experience are recognized as potentially valuable towards developing various activities. The situation still remains unsatisfactory in the developing and the least-developed countries as related to health care, food and lodging, security and maintaining a minimum level of dignity for elderly people. The rapid ageing of the world population encounters two powerful forces: globalization and urbanization. Older persons live longer and leave the working place earlier. Their accumulating knowledge and practical experience may not fully contribute to development activities. As emphasized by the United Nations catch phrase 'a society for all ages', older persons could contribute to society as mentors, advisors, teachers and creators. On the other hand, lifelong education will facilitate the creation of a dynamic society, which could benefit, support and maintain a positive social order, promote productivity and enhance a society for all without discrimination on the basis of one's age.

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# II

## PEOPLE WITH DISABILITIES

*Seamus Hegarty*

### INTRODUCTION

In the sweep of history, the twentieth century will stand out as a time when people with disabilities began to come into their own. It was increasingly recognized that society had a civic responsibility to people with disabilities, as to any other disadvantaged group. Provision of all sorts – education, medicine, rehabilitation, housing and employment – was elaborated, in many cases for the first time. While there is still much to achieve, and access to ordinary social goods is extremely uneven, people with disabilities have progressed from a situation of widespread marginalization to one in which their rights to social goods are at least acknowledged. Moreover, in some countries, considerable help is available to enable them to live as full members of their communities.

Despite the progress made, significant problems persist. These fall into two broad groups: limited availability of provision, and the inappropriateness of some of it. In developing countries and in rural communities more generally, many people with disabilities who could benefit from support do not receive it. This can be explained by a lack of technical resources or expert staff or by the fact that services originally developed in a technocratic, urban context have failed to adapt to markedly different situations in other communities. The second set of problems derives from the inappropriateness of some models of provision and, in particular, their failure either to respect individuals' autonomy or to challenge segregative attitudes and social arrangements.

Estimates of the number of people with disabilities at a given time are complicated by problems of definition and limitations in the available statistics. Whether or not an individual is regarded as disabled depends on attitudes to individual differences, the extent to which structured definitions are in use and the availability of provision. The collection of statistics on disability is extremely variable and is based on different category systems.

E. Helander reviewed the available statistics and concluded that the global average for the prevalence of moderate and severe disability was about 5.2 per cent.[1] Estimates across countries varied from 0.2 per cent to 21 per cent, illustrating the difficulty in obtaining sound statistics.

It is clear, however, that the number of people with disabilities worldwide is extremely large.

### SOCIETAL ATTITUDES AND PROVISION

The history of societal attitudes to people with disabilities, and of the resulting provision, can be schematized in five stages: rejection, neglect, care, elaboration of provision, and inclusion. This schema is not intended to offer a precise, linear account; the stages overlap and are manifested in different ways according to the countries. Its purpose is rather to provide an explanatory framework for a diverse set of phenomena.

#### Rejection

In ancient Sparta, deformed infants were left to die of exposure. Other societies too have sanctioned the killing of children who were perceived as imposing an excessive burden on the community. This ultimate rejection had generally disappeared by the beginning of the twentieth century, but people with disabilities experienced – and continue to experience – rejection in a variety of other ways, ranging from social rejection to the denial of legal rights. Within disability politics, there is a radical viewpoint that certain medical interventions such as amniocentesis (a process that screens for abnormalities in the developing fetus) and cochlear implants (surgically inserted electronic devises that restore some sound to totally deaf persons) constitute a rejection of disability; amniocentesis, because it is used to identify and abort damaged fetuses, and implants because they devalue and even threaten the existence of natural sign languages.

#### Neglect

Education and social services have advanced through the twentieth century, in terms of both sophistication and

coverage. However, those with disabilities have regularly been ignored in these developments or have had services extended to them much later than their peers. As access to schooling spread, for instance, children with disabilities were often overlooked, and in many countries they were considered ineducable. Where education was provided, the ministry of education was often not involved; educational arrangements for these children were routinely entrusted to ministries devoted to health or social affairs (this situation has changed in recent years; most, though by no means all, countries now manage education for all children and young people within a single administrative framework). Similar neglect can be seen in relation to employment, housing and leisure: people with disabilities were widely ignored or marginalized in these essential areas of human experience.

## Care

Early improvements in the condition of the disabled arose from benevolence, whether fed by humanitarian concern, religious belief, or direct contact with people with disabilities. The centuries-old tradition of caring for the disadvantaged was extended intermittently from the eighteenth century to the disabled. Charitable initiatives initially led to schools for the blind and the deaf, followed, during the nineteenth and early-twentieth centuries, by schools and other institutions for children and adults with a variety of disabilities. Many institutions for adults with a mental handicap had little or no orientation to human development, and residents lived very restricted lives. Humanitarian concern remains a potent stimulus for educational, employment and rehabilitation initiatives concerning people with disabilities. Making adequate provision for the disabled entails additional costs, and very often the required resources are funded by voluntary bodies, charitable foundations or aid agencies (Plate 63).

While some outstanding provision has been established in this way, its origins in benevolence define people with disabilities as objects of kindness rather than recipients of entitlements. A more radical critique construes benevolence as a form of social control and highlights the negative features of provision associated with it. Thus, institutional provision is seen to serve professionals' self-interest and society's economic concerns rather than clients' well-being.

## Elaboration of provision

The outstanding feature of the twentieth century as regards people with disabilities was the elaboration of provision and specialist services. These developments drew from a wide range of sources: a general expansion in medical and social services, new understanding of disabilities, campaigning by pressure groups, research inputs, technical advances, increased prosperity, and legislation. Progress was uneven across and within countries, and developing countries had only a limited share in it, but the achievement was nonetheless significant (Plate 64).

Developments in education, a critical determinant of an individual's chances in life, included extending schooling to many previously excluded from it, targeting teaching approaches on individual need, reforming regular schools so that they provided appropriate, high-quality education for many more pupils and devising vocational training that

took into account individuals' capacities as well as job requirements. Rehabilitation services developed especially in the second half of the century, driven by medical and surgical advances and drawing on rehabilitation techniques developed for war-wounded people. As a result, people with disabilities in some countries have access to a range of medical interventions and therapy services and are better equipped both for employment and daily living.

A significant factor in the above-mentioned developments was the acknowledgement of the rights of individuals, as reflected in much national legislation but also in international declarations. Two important United Nations instruments – the Universal Declaration of Human Rights (1948) and the Declaration of the Rights of Disabled Persons (1975) – represented important symbolic steps. More concrete action followed from the International Year of Disabled People proclaimed by the United Nations in 1981, which marked a turning point in promoting issues relating to disability. This initiative stimulated activities within United Nations agencies, such as the International Labour Organisation and UNESCO, as well as at the regional level (the European Community) and national levels. In particular, it led to the United Nations World Programme of Action concerning Disabled Persons in 1982, and the subsequent Decade of Disabled Persons (1983–1992). In 1993, the United Nations adopted the Standard Rules on the Equalization of Opportunities for Persons with Disabilities, which urge governments to take the necessary steps to make systems and social structures accessible to people with disabilities.

## Inclusion

Towards the end of the twentieth century, the inadequacy of provision based on either benevolence or technocratic expertise began to be recognized. Several brands of social ideology fed into this: the Scandinavian belief that people with disabilities should live as normal a life as possible; the notion, elaborated by the anti-psychiatry movement in Italy, that large institutions provided an unsatisfactory living environment; the insistence on the civil rights of the disabled prevalent in the United States; and the growing demands for self-advocacy, whereby people with disabilities are expected to have a significant say on all matters affecting them. These developments were associated with a radical critique of existing provision which, when not marginalizing people with disabilities, was seen as reinforcing their minority status.

In the classroom, these developments led to a movement away from mainstreaming and towards inclusion. From the 1970s onward, a great deal of campaigning, research and innovation had centred on mainstreaming or integration in the sense of placing pupils with disabilities or learning difficulties in regular schools. While this led to more appropriate education in many instances, it was not enough, and more radical changes in regular schools were sought. These entailed creating new kinds of school that were defined and resourced in terms of meeting the particular needs of every pupil as an integral part of the school's provision, regardless of the individual pupil's disabilities or learning difficulties.

Community-based rehabilitation also challenges traditional models of practice with their excessive reliance on institutions and specialist expertise. People with

disabilities come from families, and the goal must be to locate rehabilitation measures within their families and the communities. This approach does not to reject expertise but recommends that it be deployed at the local level so that people with disabilities can live unrestricted lives within their communities.

These are examples of the general demand for people with disabilities to be included in everyday life and for action to focus on removing the social and institutional barriers that prevent integration. Given that these barriers exist in society and its segregative institutions and not in individuals with disabilities, action should be directed to the former rather than the latter. By the close of the century, these views were gaining ground but were far from widespread. There was a great deal of rhetoric in their favour, but much provision continued to be couched in terms of enabling people with disabilities to fit into society rather than reshaping social institutions so that they included all people, regardless of their disabilities.

## CONCLUSION

The twentieth century has seen major advances in the understanding of disability issues, in the legal status ascribed to people with disabilities, and in the range and sophistication of provision available to them. However, these advances are spread unevenly. While the situation of some people with disabilities has improved greatly, many others, particularly in developing countries, continue to be marginalized in their societies and to live extremely impoverished lives.

The challenge for the years ahead is twofold: to extend the best of current provision, and to ensure that people with disabilities can participate in decisions that affect them. Many people with disabilities continue to be neglected and marginalized in their societies. Improvement will come partly from obtaining more resources and deploying available resources more effectively, partly from securing commitment to action from governments and social institutions, and partly from changing attitudes ensure that people with disabilities are regarded as full members of their communities. All of this must be accomplished in a suitable context, that is, one in which the voice of the disabled is heard, the disabled set the agenda and shape decisions that affect them, and disability is seen as part of the normal pattern of differences between people.

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# 12

# TRADITIONAL SCIENCE AND KNOWLEDGE IN EAST AFRICA

*Judith Mbula Bahemuka* and *Wellington N. Ekaya*

## INTRODUCTION

In Africa, the potential role of traditional knowledge systems in the arena of sustainable development began gaining prominence in the 1970s. Scholars started voicing concern over the failure of development efforts to improve the living standards of local communities, thus underlining the need to review development strategies and alternatives. The major focus was placed on the advancement of indigenous peoples in the context of prevailing physical conditions. More specifically, the idea of preserving the indigenous communities' resource base, while at the same time incorporating their knowledge within planned development packages, became imperative and topical. Thus, identification of local constraints and viable development efforts responsive to the social and environmental impacts of change required assessment.

Within this context, it must be noted that local ideological and institutional structures are important springboards acting to minimize the adverse effects of development packages. The underlying logic is that local people have their own ways of sustaining their own development. It follows that any development effort will fail if it is culturally offensive, socially insensitive, and ecologically incongruent with local knowledge.

The principle underpinning traditional knowledge and science is that between the physical environment and human activities there is always a mediating factor, a collection of specific objectives and values, and a body of knowledge and beliefs constituting the dominant cultural patterns. This knowledge is specific to certain societies and localities. It is created by one generation and passed on to succeeding generations through socialization. Traditional knowledge and science therefore constitutes an important component of culture. Culture itself is subject to change, but communities tend to cling to certain cultural elements, which generally persist even amidst sweeping changes. Early studies of African traditional knowledge systems were conducted on agricultural practices, for example among the Sandawe and Nyiha of the United Republic of Tanzania (Plate 65). Contemporary studies in traditional knowledge systems aim at adapting modern innovations to local

knowledge in order to induce change. This recognition of the variation in cultural approaches to resources ensures sustainable development.

This chapter deals with traditional technical knowledge within the East African region. It draws examples from some of the ethnic communities which have developed the art of herbal medicine and sustainable livelihoods through traditional irrigation systems for small-scale farming.

The term *traditional knowledge* conceptually brings into sharp focus and underscores the originality of the knowledge as perceived and practised by communities in a specific locale. The term *knowledge* as used in this context refers to collective perceptions, traditions, lore, and other associated knowledge and practices, whether intentional or unintended. Traditional knowledge consists of a large body of collective perceptions, traditions, lore, and practices generated by rural communities over time for various purposes. It is unique to a culture or society and believed to be consistent with coherent sets of cognitive techniques. It has been variously known as indigenous knowledge, traditional wisdom, indigenous technical knowledge, traditional knowledge, and community knowledge. This system of knowledge includes concepts, beliefs, perceptions, the stock of knowledge and the processes through which it is acquired, enriched, stored and transmitted. Traditional knowledge develops over generations as a product of human–environmental system interactions. Through indigenous creativity and innovation, traditional knowledge remains dynamic and often borrows from other knowledge systems through contact.

Ethnoscientists do not agree with the assumption that society can live in ambiguous and non-defined relationships with its socio-cultural, physical, and technical environment. This position is clearly defined by works of different scholars from several perspectives. On the one hand, learning can take place only when an individual wants something (value-aspirational base) or notices something (awareness governed by selective perception derived from existing knowledge). On the other hand, human beings are constantly defining their environment so as to derive meaning and a format for action. These two arguments can be taken to imply that communities are constantly reviewing and arranging all

signals emanating from the environment to present a unified definition of the situation. It is this act of defining each situation that gives communities a frame of reference for decision-making.

The work of ethnoscientists can be evaluated in light of earlier arguments on learning theory. In the works of McClelland, there is a fundamental assumption that learning and evaluation of new ideas and technologies are related to existing and accepted arrangement of relationships, ideas and technologies. Traditional knowledge acts as the catalyst, which influences modern scientific innovations, partly by communication, interaction or environmental stress.

In spite of the differences in terminology used by different communities, societies and professions, there is evidence that ethnic communities possess immense knowledge of the systems in which they live, together with the system components with which they come into contact. Furthermore, they have developed effective ways of utilizing the knowledge to sustainably and wisely interact with their total space.

Traditional knowledge is passed from one generation to another by word of mouth through an elaborate system. This education technology is codified in the language structure and social interactions between members of the ethnic group. This kind of structure leads to a shared knowledge, a kind of science.

In essence, traditional knowledge is interactively derived and embedded in the cultures of communities. It is adaptable, appropriate, and technical (the technical side being embedded in its practical nature and capacity) so as to provide sustainable utilities. It is therefore a practical type of knowledge based on intimate experience accumulated over many generations. This ultimately forms the core of the process of community development.

## TRADITIONAL KNOWLEDGE

Traditional knowledge possesses a number of unique distinguishing properties:

a) It is generated within specific communities wherein it forms the basis for, *inter alia*, decision-making and livelihood strategies.

b) It is location – and culture – specific but allows for some degree of overlap due to contact between communities or cultures.

c) It concerns critical issues related to humans, their environment and resource management.

d) It is oral in nature and not systematically documented.

e) It is dynamic and based on innovation, adaptation and experimentation.

Prior to the general awareness of the value of traditional knowledge, certain practices were considered to be associated with superstition and witchcraft. Within the past quarter of a century, the applicability and usefulness of traditional knowledge has been gradually recognized by professionals and practitioners in various fields. Traditional knowledge is less expensive, readily available, environmentally sound, and most importantly, it has a proven record of effectiveness. However, professionals are

often unfamiliar with such knowledge owing to its oral nature. It appears clear that the use of such knowledge to foster sustainable natural resource management and development is vital.

## Traditional knowledge and science in sustainable development

Natural resource management in African pastoral systems has tended to emphasize the international scientific value of resource conservation and biological diversity, which has dictated the 'what, where and how' in relation to conservation efforts in Africa. For instance, IUCN (International Union for Conservation of Nature) noted that many biodiversity conservation strategies have failed to effectively address African values, priorities and practices. Africa's dependence on biological resources for economic and natural purposes has not been given adequate recognition.

For a long time, there has been some antagonism between the wide range of traditional resource management systems practised by African farmers and the conventional or mainstream range management, which has been advocated by development institutions, academicians and modern society in general. On the one hand, conventional range management dismisses traditional resource systems as primitive, self-destructive, and thus too unproductive to provide goods for the increasing human demands. It has since imposed its de facto authority in matters pertaining to pastoral development. On the other hand, farmers have interacted and, at times, accepted – albeit with suspicion – this approach to survival and development that often conflicts with tradition and culture. This accounts for the numerous failures characteristic of development interventions in rural Africa.

Debate on sustainable development stresses the importance of harmonizing traditional knowledge and Western science. *Agenda 21*, a comprehensive plan of action adopted by the United Nations at the 1992 Rio Summit, for example, notes that governments should provide local communities and resource users with the information and know-how they need to manage their environment and resources sustainably, applying traditional and indigenous knowledge and approaches when appropriate (Plate 66). However, the challenge consists of determining the manner in which such integration can be achieved, considering the differences between the two epistemologies. A general overview of the two systems of knowledge is presented in Table 1.

From the foregoing discussion, it is clear that traditional knowledge can be used to complement modern science. The following two examples are derived from the experiences of communities in East Africa.

### Case study: range management among the Masai of East Africa

Conventional range management is a multidisciplinary field bringing together scientists in biological sciences, social sciences and policy-makers. It depends on basic sciences, concerns grazing animals and forage in uncultivated lands in sub-humid, semi-arid and arid regions and focuses on the production of animal products, water, timber, wildlife and recreation that are useful to humankind.

*Table 1* **Traditional ecological knowledge and Western science**

| Traditional Ecological Knowledge | Western Science |
| --- | --- |
| Oral tradition | Written tradition |
| Learned through observation and hands-on experience | Taught and learned (abstracted from the applied context) |
| Holistic approach | Reductionist |
| Intuitive mode of thinking | Analytic and abstract reasoning |
| Mainly qualitative | Mainly quantitative |
| Data generated by resource users | Data collected by specialists and experts (exclusive) |
| Diachronic data (long-time series on one location) | Synchronic data (short-time series over a large area) |
| Environment as part of social and spiritual relations | Hierarchical and compartmentalized organization |
| Based on cumulative, collective experience | Based on general laws and theories |

Adapted from Johnson, 1992.

Unlike the mainstream range management, traditional pastoral resource management is based entirely on traditional knowledge that has evolved over generations as a product of man-environment interactions. Like other sciences, ethnoscience has a variety of knowledge systems to deal with biological and physical environments (indigenous climatology and weather forecast, botany, medicine, conservation, etc.), with cognitive and ideational environments (value systems), and others that deal with the social environment. In essence, local knowledge differs from modern scientific knowledge in that it allows a greater understanding of the heterogeneity of local conditions as opposed to scientific knowledge, which may be developed into universal generalization for a wide range of situations. The exploitation of indigenous plants and animals using rudimentary technology requires knowledge of the local ecological conditions.

Despite the apparent differences and dissimilarities between the two systems of resource management as conceived and practised for a long time in the African pastoral system, there are a number of unrecognized or ignored similarities that can be combined to improve and strengthen pastoral development.

All along, development agencies have designed and implemented livestock production rather than pastoral development in Africa. This misinterpretation of pastoral development has its genesis in the background of the development agents responsible for the design and implementation of pastoral projects, especially following the Sahelian droughts of the 1970s. Firstly, these development technicians were either from Europe or North America, where livestock production and conventional range management originated and evolved. Secondly, their African counterparts, who were largely educated in the West, tried to replicate their learning experience in their home countries. Thirdly, the successes recorded in animal production in these countries have enticed African policy-makers to readily accept the implementation of livestock development in pastoral Africa.

Commercial livestock production as practised in Europe and North America is primarily intended to increase beef production. The economic objectives of commercial beef production emphasize such parameters as optimum stocking rate and carrying capacity, weight gain, weaning weight and meat off-take in order to maximize livestock production per head. It is capital intensive in practice and confined in space. Livestock production is first and foremost geared towards the improvement of livestock and livestock products and their availability for market consumption. Its application in rural areas, as exemplified by group ranches across Africa, translated into the establishment of production units complete with disease control, water development, extension and marketing services to supply the larger domestic economy, increased off-take of pastoral animals for fattening and the strengthening of and support to livestock marketing services.

Livestock production programmes failed in pastoral Africa primarily because they took narrow conceptual and technical approaches to pastoralism, which wrongly equated livestock production and pastoral development. The programmes focused on animals and range lands rather than herders, people and institutions, thereby literally neglecting the social, cultural and ecological particularities of pastoral production systems. In addition, they failed to take into account the complexities and the development potentials and constraints of traditional pastoral organizations and production systems.

It has been stressed that pastoral development involves, in addition to livestock production, the recognition and genuine support of a pastoral entity within a wider national development programme. Pastoral development involves management of people. As such, it integrates anthropological aspects, cultural and sociological beliefs and practices of a people into a comprehensive development plan. This is in accordance with the nature of pastoral production systems where there is a strong interdependence between humans, livestock and land resources, leading to a true collaboration with nature rather than a control over nature, which is less painful and destructive.

Each culture has its own ethnomedicine, which is part of its indigenous knowledge. Knowledge of ethnomedicine provides insights into the diseases and the available medical care in a given community as a basis for considering contemporary health problems in that society. Every culture has its worldview, traditions, values and institutions, which have developed over time to handle disease and illness. Furthermore, each culture has its own disease aetiologies, medical terminologies and classification, medical practitioners and medicinal substances. Of course, a group's beliefs and response to disease and illness are hardly static; indeed, they change with time and as a result of interaction with the medical systems of other cultures. In this sense, the terms *traditional medicine* and *ethnomedicine* are somewhat misleading. The goal of the study of ethnomedicine is to understand how a society's system of medicine functions, to distinguish different types of systems, and arrive at theories concerning how these operate and change. All medical systems, including those with such labels as 'traditional' and 'ethno', are ever-changing, highly adaptable and adaptive. What appear to

differentiate medical systems are the key concepts and philosophical foundations of each system.

Traditional medicine is highly developed in Masai culture. It is based on the Masai's deep knowledge of ethnobotany (or ethnosystematics), that is, folk knowledge of botanical classification and the capacity to identify their natural environments. In traditional Masai society, herbal medicines were widely used for the treatment of both humans and livestock. Drugs are derived from trees and shrubs. The bark or roots are then mixed with water or fatty soup to make medicine, which is taken as soup, or mixed with milk, porridge, honey, blood and/or beer. Traditional Masai medicine is used to treat gonorrhoea, stomach upsets, throat infections, chest pains, dental problems, pregnancy disorders, infertility, eye diseases, fever, colds, swollen legs, painful joints, worms, and nervous disorders. It is also used to quench thirst and to give courage and strength, to treat anger or melancholy, and as a purgative or a poison.

Trees and shrubs hold ritual significance for the Masai. Only tree wood, bark and leaves may be used in 'purification' ceremonies to avert supernatural misfortune (Plate 67). The special ritual value of trees and shrubs is closely related to certain notions of Masai creation myths. The Masai believe that 'sky' and 'earth' were once one, and that it was only at the time of their separation and permanent division that rural Masai acquired their cattle, which, according to the various versions, were brought to them from *enkai* (which means 'God' and 'rain' as well as 'sky') via a rope made from the bark of a ficus tree, *Ficus natalensis*, or via a 'firestick' made from the same tree.

Perhaps the extensive Masai knowledge of ethnobotany is linked to these cosmological beliefs about their origins and their central economic resource, cattle. If so, this can help to explain the Masai repertoire of plant uses for myriad everyday tasks such as fodder for goats and medicine. But there are other reasons for the well-developed indigenous medical knowledge of the Masai, including the spatial and seasonal availability of pastures and water: the Masai's traditional migratory lifestyle forced them to inhabit multiple ecologic environments, varying from low to high altitude. On the face of it, these movements were intended to exploit resources, which were found at different places at different times of the year. The Maisai needed detailed local knowledge on the plants and grasses that grew in one place or another. This inventory of each habitat's flora had to be accompanied by their uses. Beyond this, the movements made it possible not to overuse any part of the range and so avoid the development of certain unpalatable grasses and the colonization of excellent grazing land by certain diseases and pests, especially ticks and the associated East Coast Fever. The spread of East Coast Fever is a function of the ecology of the tick vectors.

These conditions required that the Masai become skilled in epidemiology, that is, the spatial and temporal occurrence of diseases. This knowledge heavily influences the patterns of pastoralists' use and avoidance of certain areas until the signs of a disease dissipate. In addition, they would use medicinal plants both for prophylaxis and for treatment. The Masai are capable of making differential diagnosis of diseases such as foot-and-mouth, contagious bovine/caprine pleuropneumonia, malignant catarrhal fever, lumpy skin disease, anthrax and East Coast Fever. They base their diagnoses on the manifested symptoms and on indigenous knowledge of the diseases' course and known vectors.

Some traditional skills in the treatment and/or control of livestock diseases have been noted. For diseases like the East Coast Fever, the Masai's cauterize the inflamed lymphatic glands with a hot iron. The effectiveness of this 'cure' may depend on the mode of application. In addition, special herbal concoctions are used. The Masai are not entirely helpless in containing East Coast Fever.

The Masai withhold water from cattle that have contracted anthrax. Although it is not known exactly why this is done, experts speculate that withholding water from cattle in the semi-arid zone leads to an increase in body temperature and the delay of the onset of the disease. The virulence of *Bacillus anthraces* could be influenced by changes in temperature. A dramatic experiment by the famous chemist and microbiologist Louis Pasteur demonstrated that lowering the body temperature of fowl (chickens) by dipping the animal in ice-cold water increases the probability of its contracting anthrax. Due to their high body temperature, chickens are normally resistant to anthrax. Withholding water does not 'cure' the disease, but the Masai believe that it does give them enough time to trek long distances to buy the antibiotic.

The Masai have no effective cure for malignant catarrhal fever and other viral diseases. Through diagnostic skills however, they have known for centuries that the gnu (wildebeest) is a silent reservoir for this disease. This knowledge has enabled them to develop an elaborate disease control procedure involving strict separation of cattle from the gnu and avoidance of surface water as watering sources for the animals during the gnu-breeding season. Only recently did modern scientists realize that malignant catarrhal fever, which was described by an Egyptian nomadic cattle healer as early as 3600 BC, was transmitted to cattle by the gnu.

### Case study: The Perkerra irrigation scheme

The Perkerra River flows through the Koibatek District of Kenya. The traditional inhabitants of the area were the Ilchamus Masai, more widely known as the Njemps. In the nineteenth century the British explorer Joseph Thompson and his caravan reputedly stopped by the Perkerra to purchase grain from the Ilchamus. How did the local pastoral-oriented community manage to obtain grain? The answer can be found in the Masai's capacity to understand their environment. In order to survive, the community developed an elaborate irrigation system based on traditional water management and basin irrigation. They constructed rectangular-shaped basins, with an area of 6 to 9 sq. yards, that were flooded via an opening. Once the canal was full, the opening was sealed and another opening was made in the next row of canals. The Njemps community has maintained its knowledge of water use, control and distribution to the present day. This knowledge can be tapped to enable other communities to respond to their developmental needs.

### Challenges to indigenous knowledge

The spatial and ecological design of traditional Masai life provided a stable foundation for their economy and

welfare. Traditional medicine flourished. Occasionally, such as occurred in the late nineteenth century, the risks of drought and disease can overwhelm traditional arrangements, placing severely strains on their system of medicine. During such times, appropriate interventions using their know-how, in irrigation systems for example, become crucial.

British colonial intervention in the land of the Masai dealt a blow to traditional ecosystems. Large chunks of land around Lakes Naivasha, Elmenteita, Nakuru and Baringo in Kenya and the rivers flowing into them were adversely affected. Such lands were always crucial to the proper management of the Masai pastoral system by providing dry season herding resources. Native reserves were created in the drier areas of their territory.

As populations of livestock and humans increased, natural resource degradation set in. In Masai territory, there has been a dramatic reduction of vegetation diversity over the past several decades. The evidence for this includes the further colonization by the *Tarchonanthus camphorates* bush[1] and the destruction of forest vegetation and grassland, which began during the colonial period. This process has left occasional patches of trees and bushes. With this destruction, indigenous medicinal plants have disappeared, thereby affecting the supply of Masai traditional medecines and, with it, precious indigenous medical knowledge.

There is little systematic recording of this rapidly disappearing knowledge because the older members of the community have been the traditional repositories of this knowledge. Leading scholars have called for a thorough and systematic survey, collection, identification and proper documentation of medicinal herbs with a view to building a germ plasm collection. In order to do this, ethnomedical information is required to create proper standards for traditional medicine, thereby enabling its use in the general context of health care. Such information may be obtained from traditional medical practitioners, published literature and oral sources within the community concerned. The data will make it possible to extract natural drugs from plants and then isolate their known active ingredients. In the case of irrigation systems, the Njemps have demonstrated that traditional knowledge can be refined and augmented by modern science to provide communities with sustainable livelihoods. Such is one of the challenges facing scientists in the twenty-first century.

## NOTE

1.      I. Sindiga, 'Land and Population Problems in Kajiado and Narok', in *African Studies Review*, No. 27 (1), pp. 23–39, Amherst, MA, 1984.

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# 13

## MODERN SCIENCE AND CHANGING NOTIONS OF TIME, SPACE AND MATTER

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### INTRODUCTION

As the First World War was raging, providing yet more evidence of human folly, new scientific knowledge that would revolutionize our perception of the world was taking shape at a speed quite unprecedented in the history of humankind. This expanded vision would also revolutionize our perception of ourselves and our basic concepts of knowledge. Once the smoke from the epic confrontation finally cleared, the landscape that emerged was nearly unrecognizable, so great were the intellectual and scientific transformations affecting our understanding of the natural world.

The most ambitious and surprising change, which gave rise to heated debate and was a source of fascination for many, concerned the new vision of the physical world and the Universe. In May 1919, the astronomer Arthur Eddington led a scientific expedition commissioned by the Royal Society and the Royal Astronomical Society of London to the Gulf of Guinea and Brazil to observe a solar eclipse on the equator; the expedition was a symbol in itself. The challenge extended far beyond the bounds of astrophysics and knowledge of the Sun's corona and solar eruptions; indeed, the main purpose was to see if any curvature could be observed in light rays from stars as they passed close to the Sun. Any such observation would prove that space was bent by the large masses of matter it contained and thus support the general theory of relativity presented by Albert Einstein at the Berlin Academy of Sciences in late 1915.

Einstein's theory of relativity radically changed our physical notions of space and time, and with it the kind of intuitive assumptions about physics that had prevailed for more than two hundred years. Over the same period, *cosmology* almost literally brought the entire Universe within the scope of scientists, who were realizing how immense it was and would soon discover that it was expanding. The final years of the First World War had been decisive, paving the way for another, and perhaps even more radical, revolution. This concerned a new understanding of what constituted 'common' matter in its innermost structure: first the *atom*, then the *subatomic structure* that emerged during the 1930s and 1940s following the impact of *quantum physics*. Off in a quite different direction, during the 1930s a

number of scientists, working on the findings of Henri Poincaré, explored the mathematical theory of *dynamic systems*. This theory produced concepts of 'deterministic chaos', starting in the 1960s.

All other areas of science, and specifically other exact sciences or natural sciences, underwent considerable change during this period. The so-called formal sciences, such as the different branches of mathematics and logic, saw changes that brought into question their very foundations, while operational calculus and computer science were also beginning to emerge. Like physics and chemistry, the natural sciences, and especially biology, felt the aftershock of the quantum revolution, which altered interpretations of Darwin's theory of evolution, and gave rise to immunology and genetics and the biomolecular approach that would prevail in the 1950s. Neurophysiology, supported by the latest techniques of physics and chemistry, expanded greatly from the 1980s on, bringing with it the growth of cognitive sciences. In geology, pioneering work on continental drift begun by Alfred Wegener in 1912 was confirmed by the theory of plate tectonics. Although rejected at the time, these breakthroughs turned out, fifty years later, to totally alter our perception of the world. Wegener's findings were consistent with work in other disciplines (e.g. the evolution of the Universe, the 'life and death' of stars involving chemical elements and the evolution of life). These showed that constant change is the cosmic, physical and biological world, that matter and the Universe are one, and that all these processes are interconnected.

Thus new borderline sciences emerged and, like the shifting and thrusting of continental plates forged over thousands and millions of years, they too gave rise to new and different perspectives of the world we live in.

### NEW CONCEPTS OF MATTER, SPACE AND TIME

#### The theory of relativity

The theory of relativity was developed in two stages in the early twentieth century. The first stage, *special relativity*,

arose from the need to reconcile two well-established sciences: the mechanics of physical bodies and the dynamics of electromagnetic fields. By expressing the invariance of the laws of physics in uniform motion in a straight line (i.e. *inertia*), the concepts of space and time as defined and accepted since Newton had to be changed: they were no longer independent and absolute, but merely relative, as was the concept of *simultaneity* in the frame of reference of spatial coordinates and the time related to them. Their close relationship was then expressed as a new physico-mathematical concept: four-dimensional *space-time*. Mass is a form of energy, as expressed by the formula E=mc², which became famous when it was later tested and applied in nuclear reactions.

The second stage, the *general theory of relativity*, arose from two key considerations: the arbitrariness of physical invariance being restricted solely to inertial motions, suggesting it might be extended to the most general accelerated motions; and equal local acceleration of bodies in a gravitational field (Galileo's law of falling bodies) – stated by Einstein as a *principle of equivalence*, between a gravitational field and accelerated motion. The theory, as developed on these bases using the mathematical formalism of space-time and absolute differential calculus (tensor calculus), meant a new generalized theory of relativity of gravitation could be expressed producing the space-time structure for physical spaces that were no longer Euclidean, and for non-uniform times: in other words, the curvature of space is determined by the masses contained in it and the gravitational fields they generate.

These two stages in the theory of relativity were originally the work of Albert Einstein. He pursued a line of thought based on the idea of the invariance of the laws of physics in transformations due to relative movements, and, from that perspective, he criticized existing theories of physics. The special theory of relativity emerged (retrospectively) as a prelude to the general theory of relativity. The fundamental originality of the second theory, which developed solely in the brain of Albert Einstein, confirmed the clear idea already present in the first theory, making it more radical still. It was his idea to change the concepts of space and time and to endow them with *physical content* dictated by general properties of matter, such as those expressed in the statement of the *physical principles* of the theories.

## Special relativity

Certain aspects of special relativity had, however, already been explored in other studies preceding or concurrent with Einstein's research; the most prominent were by Hendrik A. Lorentz and Henri Poincaré, who had presented the properties of *electromagnetic dynamics*, formulating equations similar to Einstein's, yet working on quite different conceptual content. In their view, the formulae for transforming the coordinates of space and time (referred to by Poincaré as 'Lorentz's transformations') – which, they argued, were needed for electromagnetic dynamics – could still be reconciled with the concept of absolute physical space (the ether at rest) and absolute, physical time, consistent with Newton's classical mechanics.

Einstein's theory, published in 1905, originally covered the 'electrodynamics of moving bodies', a theory he tried to refashion so that it would fit the 'principle of relativity'. His

theory stated that laws of physical phenomena did not depend on the motion (i.e. in a straight line and uniform, or 'inertia') of the bodies which were the focus of these phenomena. To do this, Einstein actually embarked on a much wider change, going beyond the initial project and producing what is known as the *(special) theory of relativity*, stating an invariance condition (or more accurately, one of *covariance*, i.e. not linked to any specific dynamics, but required of *all dynamics*).[1]

It seemed to Einstein that the validity of the principle of relativity, used previously for mechanics, should be extended to optics and electromagnetism for both empirical and theoretical reasons. The empirical reasons were actually generalizations of the findings of experiments on groups of *proven phenomena* rather than isolated observations; they were related to optical and electromagnetic phenomena which remained unchanged in systems at rest or in relative motion: it was therefore impossible, for example, to extrapolate the absolute motion of the Earth in relation to the 'ether' (the medium assumed to transmit waves) on the basis of these findings. However, electromagnetic theory (as formulated by James Clerk Maxwell some decades earlier) used the reference system of the *ether*, assumed to be at rest in the absolute space of Newton's mechanics, making its role too important and skewing it in relation to the set of systems in uniform motion and in straight lines.

This skew was not consistent with the principle of relativity, which the phenomena seemed to fit in other respects. Einstein noted this contradiction and ascribed it to a fault in electromagnetic theory (which did not comply with the principle of relativity), and also to the inadequacy of mechanics, laying down definitions and general laws on motion and relating them to absolute space and time, independent of physical phenomena. Einstein went on to change these two interrelated theories, yet retaining their most fundamental properties as a universally valid principle of physics: the *principle of relativity* for mechanics and the principle of the *constant speed of light in a vacuum*[2] for electromagnetic theory. The two principles appeared to be incompatible: if the speed of light was constant in the ether (absolute rest), it had to be different in any system in motion with reference to it, and this was contrary to the conditions of the principle of relativity. Yet (as Einstein realized), the incompatibility arose from the implicit assumption that the speeds of the two motions (here, the speed of light and the speed of the frame of reference) were calculated according to Galileo's law of the addition of velocities.[3]

But this rule could and indeed had to be abandoned, provided a new definition could be given of the *velocity* parameter, i.e. the *distance* and *time interval* to which it is related, imposing on these the two principles of physics so as to give them a *physical value*. Einstein, working on ideas previously expounded by Ernst Mach and Poincaré, began by pondering simultaneity, which was absolute for instantaneous actions (in Newton's physics), but only relative (to a specific frame of reference and not to all) for actions propagated at a finite speed. A new definition of the physical concepts of space and time, i.e. concepts given in relationships with phenomena, would then follow. The shift from one point in space to another and from one instant in time to another requires consideration of physical phenomena (e.g. the transmission of a light signal) operating between these spaces and times, and applying the two principles chosen.

On the basis of these considerations Einstein directly deduced transformation formulae that allowed a shift from one system of coordinates and time to another system in relative motion (Lorentz's transformations), showing there was mutual dependency of the time and space coordinates. These formulae then led to a new (relativistic) law of the composition of velocities for the constant speed of light when combined with any other speed, thereby making it an absolute limit.[4] This also led to the symmetry of relative motions and the end of the choice of *ether* at rest as the frame of reference: the very idea of ether, seen as a sort of half-way medium between matter and space, then became redundant.

The special theory of relativity that arose from these considerations led to new kinetics that could be applied to all systems of physics regardless of their dynamics, and which complied with the dynamics of Newton's mechanics in the approximation of low velocities.[5] In relativistic kinetics, relative distances are shortened in the direction of the motion, and relative time intervals get longer. This relativity of time and space means that a body in rapid motion seems shorter when seen from a system at rest in relation to it, and that the ticking of clocks there is slower. Paul Langevin later used this idea in arguing his 'thought experiment' on two twins being reunited after a cosmic voyage and having different ages. The same reasoning applies to a short-lived particle in its own system,[6] produced in the upper atmosphere through the interaction of cosmic rays, and able to reach Earth before it disintegrates: its lifetime in the laboratory frame of reference is extended because of the high speed of its motion. Similarly, high-energy particles produced in accelerators have a longer life in the relative system at rest where they are detected. Such experiments were not conducted until a long time after the special theory of relativity was first propounded, but they provide a direct illustration of it. They are commonly used today and have helped physicists become familiar with these concepts, which they now intuitively take for granted.

The relationship between mass and energy is a consequence of new kinetics and applies to any element of matter. It is more apparent with high levels of energy or exchanges of energy, as with radioactive decay and nuclear reactions, but applies generally. It has even been observed over recent years in certain chemical reactions of elements high in the periodic table with high binding energy in the inner atomic layers.

The main part of Einstein's special theory of relativity is in these properties: they concern new 'kinetics', i.e. a new way of conceiving and formulating the general properties of the motion of bodies in space and time, and having effects restricting the form of dynamics, because of the requirement of *covariance*, i.e. the principle of relativity mathematically transcribed on the form of the quantities in the physical theory and its equations. Hermann Minkowski presented a mathematical theory of space-time soon after this, basing it directly on Einstein's special theory of relativity. He took the idea originally stated by Poincaré that time should be entered as a fourth, but imaginary, space coordinate.[7] Spatial coordinates and time were then replaced by *space-time*, a four-dimensional continuum with three dimensions for space and one for time, bound together by a space-time structure constant, which was none other than the speed of light, an invariant in all transformations.[8]

## General relativity

The general theory of relativity extended the scope of critical study of the concepts and formulation of physical theories related to the question of the relativity of motion by generally applying the invariance of the laws of physics to any (accelerated) motions. With this requirement, Einstein had the idea of expressing the basic fact of gravity (i.e. Galileo's law of falling bodies stating that all bodies falling from the same height have the same acceleration) as a 'principle of equivalence' (located at a given point in space-time) between a homogeneous gravitational field and a uniform acceleration force. A person inside a free-falling elevator is not conscious of falling, the fall being cancelled by the drift of the accelerated motion. This was consistent with the argument of there being a fundamental property in every gravitational field, related to accelerated motion. It was then possible to produce the (relativistic) theory of the gravitational field solely by considering *general covariance* (the same form of the law on transformations of coordinates for any movements). The mathematical representation of Minkowski's space-time diagram made it possible to formulate this statement, using non-Euclidean curvature of space (Riemann's geometry).[9] The form of space-time (given by the metric) is physically determined by the gravitational fields involved, according to the equations Einstein had formulated by late 1915.[10] The existence of the general theory of relativity demanded even more radical changes to thinking about the physics of space and time than did special relativity: space and time were not only interrelated, but were related to matter itself; space-time no longer stood as a framework outside the phenomena occurring within it, but was physically affected by them; relations of distance and time interval at any and every point were subject to the gravitational field at that point.

Three physical consequences arose directly from Einstein's theory: the perihelion shift of the planet Mercury, the fastest planet in the solar system, as observed in the mid-nineteenth century by Urbain Le Verrier but unexplained by Newton's theory of gravitation;[11] the bending of light rays in a gravitational field, which is equivalent to the curvature of space near large masses, as reported in 1919 when observing the solar eclipse mentioned above; and the red shift of the wavelength of light in a gravitational field, observed some time later. The extension of time, which is the parallel phenomenon, was later observed with accurate measurements on atomic clocks positioned near mountain ranges.

Other deductions arising from the general theory of relativity subsequently proved to be of great importance, for example, the existence (as posited by Einstein as early as 1916) of *gravitational waves* (variations in the gravitational field conveyed in space, such as space-time ripples); these ripples are to Einstein's relativistic theory of gravitation what electromagnetic waves are to Maxwell's theory. Indirect proof of the existence of these waves was found by R. A. Hulse and J. H. Taylor observing the oscillations of a binary pulsar (the '1916+17' system). It is extremely difficult to verify these findings because of the tiny level of the gravitational constant and the large masses of matter required. Projects like 'Virgo' in Europe and 'Ligo' in the United States are constructing giant antennae to detect gravitational waves coming from the cosmos (explosions of *supernovae*), and may provide the verification needed.

Other major consequences of the general theory of relativity concern very high-density celestial objects such as 'black holes' and even the emergence of cosmology as a science (see below). The general theory of relativity was remarkably fruitful for describing the physical universe, but this did not become apparent until the 1960s, with developments in astrophysics and observational cosmology. Prior to this, the theory had attracted the interest of a small number of researchers (mostly mathematicians), who worked on it for its formal beauty. It is now considered to be one of the principal theories of physics, along with quantum physics, and is seen as the theory of gravitation and cosmology.

## QUANTUM PHYSICS

Quantum physics is a subject of considerable scope, covering the deepest structure of matter in general, from cosmic objects to the bodies in our environment and the very atoms of which we are made. It provides an explanation for the unity of matter in the diversity of its organizational forms, from molecular combinations of atoms to the properties of the atomic nuclei and the elementary particles contained, actually or 'virtually', inside the nuclei. The tool for the theoretical understanding of this field is built around *quanta* applied to specific theoretical models (atomic or nuclear models) and extended, from a fundamental viewpoint, as the *quantum field theory*. As quantum electrodynamics, the theory can accurately describe the properties of atoms, determined by the electromagnetic interacting field. The most recent extensions of the quantum field theory, and covering other interactions operating at the level of the nucleus, include 'gauge fields'. They have been done in the conceptual framework of quantum mechanics, providing confirmation of its heuristic potential.

While the conceptual framework adopted in the late 1920s broke away from a number of features previously ascribed to the description of physical phenomena, it has given rise to problems of interpretation, for questions both physical and philosophical. Heated discussion among leading physicists of the age contributed to the founding of the theory.

### The quantization of radiation and atoms

The introduction of quanta to physics goes back to research on radiation conducted in 1900 by Max Planck. He developed a hypothesis on the discontinuity or 'quantization' of the energy exchange in the emission and absorption of a light ray at a given frequency.[12] Planck's ideas were taken further by Einstein's initial research in this field from 1905 to 1909 (on the quantization of light energy itself,[13] this being an extension of the quantum hypothesis on specific heats of atoms, the first form of the particle-wave duality of light) (Plate 68). This discontinuity, which became a fundamental feature of physical phenomena involved in atoms and radiation, meant the entire theory of physics had to be rethought, as it was based on the continuous approach of differential equations in mechanics as with electromagnetism.

In 1913, Niels Bohr presented a theoretical model of the atom, changing Rutherford's planetary model (with electrons moving in orbit around a core nucleus carrying almost all the atomic mass and having a positive charge), quantizing the electron orbits and thus accounting for the stability of the atom and for the energy exchanges in the emission and absorption of radiation[14] by the core nucleus. Soon after, in 1916, Einstein brought together data on quantum phenomena to form a synthetic theory, but which still featured classical concepts; this was the 'first theory of quanta', and the starting point for theoretical developments that led to quantum mechanics. Einstein calculated the transition amplitude between atomic levels and showed that radiation emitted or absorbed in these transitions had dual behaviour, as both waves and particles (a quantity of motion being the wavelength, and energy being the frequency).[15] These two features were retained in quantum mechanics and in fact provided the basis for its further development. In 1923, Louis de Broglie extended the wave-particle duality of radiation to cover all elements of matter[16] (the property being verified subsequently by the observation of the diffraction of electrons and then of other particles).

In 1924, Satyendra N. Bose and Einstein noticed that the quantum properties of physical systems for radiation and for certain single-atom gases[17] were intrinsically linked to the 'indiscernibility of identical particles'. This means that the physical state remains unchanged if two of the particles are interchanged (being symmetrical in mutual exchange), corresponding to a specific statistical behaviour pattern:[18] any number of particles in a system can be found in the same physical state and are therefore phase coherent. This produced a certain number of effects that did not exist in classical physics, and which will be discussed below: Bose-Einstein condensation (Einstein, 1925), the first example of a description of phase transition, superfluidity and superconductivity.

Parallel to these findings, Enrico Fermi and Paul A. M. Dirac discovered other non-classical statistics for another class of particles, which were indiscernible and anti-symmetric when mutually exchanged. When these statistics (Fermi-Dirac statistics) were applied to particles dubbed 'fermions',[19] they described a general property called the 'exclusion principle'. This principle had been formulated some time earlier by Wolfgang Pauli working on an empirical basis: he noted that, in a physical system, two identical electrons cannot be in the same quantum state (e.g. a given atomic level). This rule accounts for the way energy levels in atoms are composed and therefore explains the organization of the periodic table of elements.

Quantum mechanics integrated these basic properties into the formalism of the wave 'function' (or state vector) to describe a physical system, either symmetric or anti-symmetric, for the exchange of identical particles (respectively, bosons and fermions): these properties comprise one of the features of the 'principle of superposition'.

### Quantum mechanics

The foundations for what was to become quantum mechanics had thus been laid. Quantum mechanics was established in 1925–26, using two different approaches but producing equivalent results: *wave mechanics*, developed by Erwin Schrödinger working on the concept of matter waves (equations from mechanics are applied to a 'wave

function' in the system), and *quantum mechanics*, as developed by Werner Heisenberg, Max Born, Pascual Jordan and Paul Dirac, calculating transition amplitudes between atomic levels without the use of any classical image such as electron trajectories. This calculation of 'observable quantities' was equivalent to matrix calculations in linear equation systems. The formalism of quantum mechanics was developed on this basis, the physical quantities being depicted by *linear operators* (which, unlike numbers, do not commute when multiplied in pairs),[20] and the state of a system by a 'state vector' on which these quantities operate.

Schrödinger showed the equivalence between wave mechanics and quantum mechanics, and in the same year (1926), Max Born (Plate 69) presented his *probabilistic interpretation* of the wave function or state vector depicting the physical system: this function, $\psi$, produced by a causal equation (Schrödinger's equation), gives the probability so that the system it describes is in the state characterized by physical quantities at given values.[21] The function $\psi$ in physics therefore means a 'probability amplitude', and Schrödinger's wave is not a physical wave in the usual sense, but an abstract entity, a 'probability wave'. The quantity depicting a physical system, the state function $\psi$, has the 'superposition' property specific to such amplitudes: any linear superposition of functions, which are solutions to the equation of the physical system, is also a solution and can therefore describe the system.

This property proved to be one of the most fundamental in quantum mechanics, accounting for its most specific features such as wave-particle duality and the diffraction of quantum particles (e.g. electrons and neutrons), the indiscernibility of identical particles, as well as the local non-separability of systems of particles (see below), and the 'oscillations' of various electrically neutral systems of particles (e.g. of neutrinos).

In 1927, Heisenberg showed that 'conjugated quantities' operators that did not commute (e.g. position $x$ and momentum $p$) featured relations of inequality in their spectral width, such as: $\Delta x.\Delta p \geq \hbar$ (Heisenberg's inequalities). Such quantities, known as 'incompatible' or 'conjugated' quantities, therefore cannot be studied together to make a joint determination of absolute accuracy.

Quantum mechanics at the time was expressed with appropriate mathematical formalism; the state function of a physical system, with its (vectorial) property of linear superposition and physical value of probability amplitude, is defined in Hilbert's Space (the elements, or vectors, of this abstract space being the space of square integrable functions). The physical quantities were no longer expressed as numbers or numerical functions, but as mathematical, linear operators, acting on the state function of the system. The state of a physical system is determined by using a 'complete set of (observable) quantities which commute'.[22]

Quantum mechanics as developed this way (with the term generally including wave mechanics) was then able to account for the properties of matter and radiation, as well as their interaction. It constituted a body of doctrine, and from 1927, when presented at the Solvay Physics Conference in Brussels, it was recognized as a physical theory with mathematical formalism (more abstract than before), complete with interpretations capable of describing physical systems. In addition to physical interpretations, such as the probabilistic interpretation of the state function, when

quantum mechanics first emerged and for a long time after, it also included a 'philosophical interpretation'. In the minds of its proponents, this interpretation was designed for rational use, even though the principal statements were unusual, differing from concepts previously accepted in physics, e.g. the reality of described systems being independent of the action of the observer, and the determinism of the variables involved in the description.

## Quantum field theory

Quantum mechanics was then seen as a conceptual framework for describing physical systems, their development and interactions. But these same systems required that dynamics be developed to account for this behaviour, for example, to actually calculate the amplitude of atomic transitions instead of entering this factor on the basis of observational data. One direction that favoured development of the dynamics of quantum systems was the quantum field theory. During the late 1920s pioneering work was being done by eminent scientists such as Paul Dirac (Plate 70), Oskar Klein, Pascual Jordan and Eugene Wigner. In 1927, Dirac had devised a relativistic quantum equation of the electron, predicting the existence of antiparticles associated with known particles (identical except for opposite charges). This provided the foundation for developing the quantum field theory (at the time only in the electromagnetic field), based on a 'second quantization' approach whereby the state function was replaced by an operator that itself acted on the state. This meant that the creation or destruction of particles or antiparticles in a physical system could then be described, and it was therefore possible, in theory at least, to deal directly with interactions between atoms, nuclei, particles and fields.

This path and others were explored over the ensuing decades, with varying degrees of success. Efforts proved extremely fruitful in the field of electromagnetic interaction, with the development of quantum electrodynamics emerging around 1947; but it was not until the 1960s and 1970s that this perspective also became the path for other interacting fields discovered in the intervening period: the strong field of nuclear binding and the weak field of $\beta$ decay of nuclei and particles. Through these transformations, the conceptual framework of quantum mechanics remained intact, and physicists became accustomed to working with this intellectual tool, which is still essential for exploring quantum phenomena, from the atomic level to the level of elementary particles.

## UNCERTAINTIES ABOUT ACCURACY AND PROBLEMS OF INTERPRETATION

While quantum mechanics gave physical theory great potential for describing and forecasting phenomena in the atomic field, it also raised problems of interpretation quite unusual in the world of physics. First, the mathematical formalism of quantum physics, which had made it so fertile, seemed far removed from any 'intuitive physical meaning'; the mathematical properties of the quantities used (e.g. the state function as 'probability amplitude' and the principle of superposition) had only an apparently indirect link with the physical properties, despite being so accurately described

and forecast. Quantum theory seemed to mark the beginning of a new type of physical theory, comprised of abstract formalism extended by a physical interpretation of its elements, whereas in previous theories of physics, the mathematical form of the quantities was directly involved in the constitution of the theoretical relationships that provided the 'physical content'.

Most importantly, quantum mechanics seemed to cast doubt not only on determinism, through its solely probabilistic forecasts and Heisenberg's 'indeterminacy' relations, but also on causality with the 'postulate of reduction of the wave packet', supposed to account for the fact that one specific physical state was observed in superposition. Superposition was often seen as the result of random interaction between the measuring instrument and the quantum system studied. One unresolved question was of direct philosophical import: do material quantum systems exist as an independent reality?

### A philosophy of observation and complementarity

In a bid to justify the unusual procedures of quantum mechanics, Niels Bohr developed a philosophical interpretation known as the Copenhagen interpretation which was considered the 'orthodox line' for almost two generations of physicists. According to this observationalist philosophy, the properties of a physical system can only be contemplated independently of the conditions of observation. In the microphysical domain of quanta, this position required continued use of classical concepts, i.e. the concepts of the measuring instruments. The interaction of the measuring instrument with the quantum system perturbs the quantum system, and, because of the irreducibility of the quantum of action, the impact cannot be countered and corrected or overlooked, as would be the case in classical physics.[23] This perturbation in the observation process is apparently the underlying reason for Heisenberg's inequalities. These inequalities express the conditions of use (and limits of validity) of the conjugated quantities classically used in the field of quantum studies, and for that reason are often referred to as 'relations of uncertainty' or the 'principle of indeterminacy'. These relations are said to express a limit to the principle of omniscience, because even omniscience cannot avoid classical quantities and must at least use complementary viewpoints as an alternative so as to gain a complete view.

By placing the first reference of knowledge within the sphere of observation, thought concerning any physical reality is then subjected to the conditions of observation, and ultimately the concept of independent reality has to be abandoned. Heisenberg, for example, stated that physics did not concern 'real objects' but the 'inseparable object-subject partnership', that it did not concern nature but our way of finding out about nature. Under these conditions, the state function, $\psi$, would be understood not as depicting the physical system as such, but as collecting or cataloguing the knowledge acquired through observation and measurement.

### The reality of an individual physical system

While this notion prevailed for a long time with physicists, it was not accepted by all the 'founding fathers' of quantum physics, and notably Einstein, Schrödinger and Broglie. One of the important moments in the Einstein-Bohr 'debate of the century' – the now famous argument referred to as 'EPR'[24] – stands as the starting point in proof of a previously unnoticed quantum property: local non-separability. Quantum theory, through the principle of superposition, cannot provide separate descriptions of two physical systems (of particles) previously joined in a single system, regardless of the distance currently separating them and despite the lack of any physical interaction between them. For Einstein, this absence of local separability, which he showed to be inherent in quantum theory, indicated that the theory was unable to describe individual systems and was therefore 'incomplete'. He believed the apparent non-separability of quantum systems did not concern individual systems, and was simply the effect of the statistical description using the state function $\psi$.

It subsequently became apparent,[25] following theoretical research by John S. Bell and high-precision experiments on correlations at a distance conducted by, among others, Alain Aspect, that local non-separability was indeed an effective property of individual quantum systems. In general terms, quantum physics describes individual systems, albeit in a probabilistic way, as has been shown by experiments to isolate these particles in a beam without perturbing them.[26] A photon, or any other quantum particle (electron, neutron or even an atom), interferes with nothing but itself. Non-locality, which is the reason for this, seems to suggest that quantum systems cannot be depicted by proper spatial representation.

These conceptual and experimental advances cast light on the nature of the quantities specific to the quantum domain and helped make them directly intelligible despite their 'counter-intuitive' quality when compared to the more tangible quantities characteristic of classical physics. However, familiarization and adaptation to a world of quantum phenomena and objects still leaves open the philosophical question of the possible existence of an 'independent physical reality'.

### Measurement and reduction

One of the most puzzling of the different problems in interpreting quantum mechanics was still the problem of measurement or 'reduction'; this was also the problem of the relationship between quantum systems and the classical and macroscopic physical systems, and of the transfer of information from the former to the latter. The literature devoted to the subject is extensive and all sorts of solutions have been proposed, ranging from actual reduction caused by the interaction of the quantum system with a microsystemic part of the measurement device, to the absence of any reduction in physical terms, as with Hugh Everett's 'interpretation of the relative state'.

Recent experiments on the 'decoherence' of quantum states seem to have had a crucial effect, suddenly making it possible to 'visualize' an initial stage of quantum superposition in the measurement process, this being transferred to the measurement device, after which the state very quickly loses its phase coherence through the many interactions with objects in the environment in the macroscopic device. The measured quantum state ends up being randomly transferred to one of the basic states of the

preparation, according to the statistical distribution for the probability of that state. What remains important, ultimately, is the total state function of the system, in its superposition form; it is found by reconstituting the coefficients on the basis of statistical observations. Essentially then, as had already been suspected by a number of scholars, reduction might be simply a practical rule for expressing this set of operations.

If that is the case, a large part of the ad hoc philosophical arguments devised in order to rationalize our knowledge on quantum theory will have become redundant.

## THE ATOMIC STRUCTURE OF MATTER

Such was the influence of positivist ideas and doctrines of energy that physicists in the late nineteenth century were scarcely interested in the atomic structure of matter. Atomic physics came into its own in the early twentieth century when the physical reality of atoms was established by counting them and determining their dimensions. Theoretical predictions in the theory of molecular movements presented by Einstein in 1905, were tested in experiments conducted by Jean Perrin (between 1908 and 1913); this made it possible to determine Avogadro's constant (the number of molecules in a mole of substance) and also molecular dimensions, to $10^{-8}$ cm. These findings, together with others, clearly endorsed the physical nature of the molecular hypothesis and the reality of atoms.[27]

Atomic physics' first concern is the properties of atoms at the *microscopic level* of the individual atom or of aggregates of atoms as molecules, thus forming the first level of the physics of the 'infinitely small'. The discipline emerged early in the twentieth century from the study of molecular properties, the electronic constitution of matter and of radiation phenomena (X-rays, radioactivity, energy quanta and atomic spectra), first developing as the physics of the atom and its internal make-up. It also concerns the macroscopic properties of matter involved in this underlying quantum and atomic structure, and constitutes the focus of solid-state physics and the physics of condensed matter. The properties of atoms and the possibilities they have of forming molecular structures, or even as complex chains of molecules, are also relevant to chemistry.

### Radiation and atomic structure

A number of major discoveries in the late nineteenth and early twentieth century – the discovery of the electron, X-rays, the splitting of spectral lines in a magnetic field (the Zeeman effect) and radioactivity – corroborated the atomic theory of matter. The discoveries also provided indications of the composite nature of the atom, making it possible at the same time to gradually penetrate the atom's internal structure. From a theoretical point of view, an initial and decisive step was made with Einstein's work on the specific heat of bodies (1907), where he extended the hypothesis of the quantization of energy exchanges to cover atoms. Specific heats were cancelled out at absolute zero, as predicted by his calculations and confirmed in experiments conducted by Walter Nernst (c. 1914); this result stood as a crucial argument for accepting the quantum of action.

Ernest Rutherford's discovery of the atomic nucleus in 1911 led to a planetary model with a central, positively charged nucleus of tiny dimensions (a few $10^{-13}$ cm), in which nearly all the mass was concentrated. The nucleus was surrounded by a cloud of orbital electrons. But this mechanical model was not consistent with the atom's being stable (because of the classical law on electromagnetic radiation requiring electrons to lose energy continuously, radiating on their orbits). Niels Bohr modified this model in 1913, with his hypothesis of quantization of energies of electronic orbits; the only electron transitions allowed were discontinuous leaps from one orbit to another, with emission or absorption of radiation making the difference in orbital energies.

Bohr's theory of the atom, modified to take into account relativistic effects, explained the simplest atomic spectra. The characteristic quantities for the levels of the atom were subsequently specified by quantum mechanics in terms of four 'quantum numbers' describing energy, the kinetic moment, the magnetic moment and the 'spin' or intrinsic angular momentum.[28] According to Pauli's exclusion principle (1925), no two electrons can occupy the same state, and this determines the arrangement of the atomic electrons and explains the periodic classification of the elements (by successive levels of energy). It was later observed that the atom lines could be broken down into a 'hyperfine structure' ascribed to the spin effect of the nucleus; this discovery led to major applications in physics (nuclear magnetic resonance, first observed in 1937 by Isidor Rabi, and the MASER quantum oscillator, invented in 1954, measuring atomic frequencies with very high relative accuracy to the magnitude of $5.10^{-12}$), as well as applications in chemistry and medicine.

### Solid-state physics and condensed matter

Solid-state physics emerged in the early twentieth century with the quantization of the energy of atoms and the study of the crystal structure (in particular of metals), using $X$-ray crystallography discovered by Max von Laue and developed by William Henry Bragg and his son, William Lawrence Bragg.[29] Thanks to their efforts the configuration of atoms in all types of solids, both organic and inorganic could be determined.

The atomic theory of matter and later, quantum theory, could also be used to describe the magnetic properties of bodies in terms of directions of magnetic moments of elementary atoms, thus giving an explanation for paramagnetism (moments aligned in a magnetic field), diamagnetism (lack of direction, the alignment being countered by thermal agitation), and ferromagnetism (ordered magnetic states of paramagnetic bodies above what is referred to as Curie temperature). Paul Langevin, Pierre Weiss, Léon Brillouin and Louis Néel are the names of some of the pioneers in this field. Quantum statistics on electrons in solids, established by Dirac, Fermi and Pauli, made it possible to develop a quantum theory of free electrons in metals (Félix Bloch, 1928). In a crystalline solid, electronic states are divided into bands of energy in accordance with quantum rules, and the arrangement (in completely or partially occupied states, determining the mobility of the electrons) is what distinguishes insulators, conductors and semi-conductors (insulators at absolute

zero temperature, semi-conductors behaving as conductors at a non-zero temperature, and with conductivity increasing with the temperature).

The establishment in 1933 of a quantum theory of solids[30] boosted the development of solid-state physics and many new technical and industrial applications during the Second World War. The transistor, for example, was designed in the late 1940s in connection with advances in radar technology, and went on to produce the next generations of electronics and computer technology.[31]

The Mössbauer effect, a phenomenon of resonance produced by the absorption or emission of gamma radiation in a crystalline network at a very low temperature (Rudolf Mössbauer, 1958), proved to be of fundamental importance for studying the properties of solids, and also for applications in many other areas, ranging from atomic physics to astrophysics: it can be used to detect extremely small differences in frequency, such as the shifts produced by gravitational fields, accelerated movements and variations in a magnetic field.

The laser (acronym for light amplification by stimulated emission of radiation), developed in 1968, was behind many innovations in both *quantum optics* and solid-state physics. Many of its applications have changed our everyday life. The laser is based on the properties of semi-conductors and on 'stimulated emission' of light, a process predicted by the semi-classical quantum theory presented by Einstein in 1916, and which led to Alfred Kastler and Jean Brossel developing 'optical pumping' of atomic electrons by accumulating atoms in the excited state (1950). Lasers produce intense beams of coherent light of a specific wavelength from stimulated excitation of semi-conductors.

Beginning in the 1970s, major advances in low-temperature physics, and particularly the access to temperatures close to absolute zero,[32] opened the way for studying collective quantum phenomena that can be observed at a macroscopic level, such as superconductivity, superfluidity and Bose-Einstein condensation. Superconductivity, or the lack of any damping of electric currents through the Joule effect in a given solid that cancels out the electrical resistance, occurs in certain metals when their temperature is below what is referred to as 'critical' temperature).[33] Superfluidity is a 'phase change' from a gas or liquid state, e.g. helium, to a 'superfluid' state, with almost zero viscosity, perfectly homogeneous and without boiling; this occurs at a very low temperature (2K for *He*-4) by Bose condensation of part of the liquid, according to the model which Fritz London and Laszlo Tisza devised for *He*-4 in 1938. It was also observed (in 1972) for the isotope *He*-3.

Einstein had formulated a theory of *Bose-Einstein condensation* as early as 1925, seeing it as a consequence of the indiscernibility of quantum particles,[34] but for many years it had simply seemed to be an intellectual stance. It was not until the end of the twentieth century that the effect was observed under experimental conditions. This was because the temperatures needed had to be lower than one millionth of a kelvin, extremely close to absolute zero. The gas or liquid atoms, being physically identical and in phase, described by the same state function, can accumulate in an individual state of minimum energy, 'zero point energy', equivalent to a mean temperature of absolute zero, provided it is possible to stop the atoms from combining to form molecules and becoming solid. Once the atoms are shifted

and have no interaction, having lost their individuality within the collective physical system (and there may be a large number of them, from a few thousand to a significant fraction of Avogadro's constant), they form a condensate, a sort of super atom in the same state: this state of 'condensation' occurs at the macroscopic level and is observed as a perfectly homogeneous liquid with no viscosity, ready to fill immediately any space made available to it. A Bose-Einstein condensate was made for the first time under experimental conditions in 1995: a few thousand identical atoms of an alkaline metal were cooled to $0.4 \times 10^{-6}$ K, and accumulated in the same individual atomic state of 'zero point energy' for approximately ten seconds.[35] Other experiments have been successfully carried out since then.

Absolute zero temperature is a threshold value which, strictly speaking, can never be reached. The increasing difficulty of getting closer to it is expressed in the 'third principle of thermodynamics', as formulated by Nernst and Planck, which states that the entropy of any physical system goes to zero as the temperature tends towards absolute zero. This principle also defines an absolute scale for entropy (determined differently in a relative way, through differences in entropy).

These developments and others that cannot be included here concern macroscopic properties of atomic matter that are quantum in origin, and go beyond the bounds of solid-state physics and concern all 'collective phenomena'. This branch of physics is now more commonly referred to as the physics of condensed matter.

## Quantum chemistry

Over the past 50 years our understanding of the way atoms bind to form molecules, in particular on the tetrahedral structure of the valences of the carbon atom in three-dimensional space (providing the explanation of optical isomerism observed by Louis Pasteur), has been confirmed and expanded using X-ray crystallography. With this technology it is possible to determine the positions of the atoms in a large number of crystals, including complex molecules such as proteins (e.g. penicillin, discovered in 1944).

The first proteins were synthesized in 1907 and comprised chains of a large number of amino acids (polypeptides). This development opened a whole new field leading to the chemistry of macromolecules, whose existence was first proved in 1922 by Hermann Staudinger. It also revolutionized industrial chemistry (e.g. with fibre-form 'superpolymers' and plastics such as nylon, produced on an industrial scale from 1938 on) and *biochemistry*, and gave rise to the new discipline of *molecular biology*.

On the theoretical side, the electronic structure of matter meant that atoms bonding to form a molecule could also be represented as a particle comprising shared electrons. Quantum physics offered prospects for studying chemical bonding, understood in terms of *covalence* and *electrovalence*, the terms coined by Irving Langmuir in 1919. In 1927, Walter Heitler and Fritz London presented a theoretical description of the diatomic hydrogen molecule ($H_2$) as a resonance of the electronic waves for both atoms and applied this finding to the theory of chemical valence. Working along the same lines in the 1930s, Linus Pauling and John C. Slater found an explanation in quantum mechanics for the

chemical bonding of many molecules and, specifically, for the tetrahedral arrangement of the hydrogen bond of the carbon atom. Theoretical chemistry, considered equivalent to physical chemistry, then became quantum chemistry.

Experimental study of the structure of molecules benefited from all the resources of spectroscopy and, as of the 1920s, infrared and Raman spectroscopy. By the 1950s there were nuclear magnetic resonance and mass spectroscopy, which was important in determining molecular structures and looking inside them. Starting in 1937, work done by Pauling to determine the molecular structure of proteins using X-ray and electron diffraction techniques paved the way for molecular biology. There were also pioneering but more speculative contributions by physicists such as Schrödinger. Following in Pauling's footsteps came Francis Crick and James Watson who, in 1953, discovered the double helix structure of the DNA molecule.

## NUCLEAR PHYSICS AND ELEMENTARY PARTICLES

### Looking inside the nucleus of the atom

The second structural level of atomic matter is buried deep within its nucleus. The two levels, atomic and nuclear, are clearly separated by five orders of magnitude,[36] and research into the very tiny dimensions of matter opened up the new domain of nuclear physics. In the 1930s, nuclear physics truly emerged with the discovery of the neutron (the electrically neutral partner of the proton in the nucleus – James Chadwick, 1932),[37] artificial radioactivity (Irène and Frédéric Joliot-Curie, 1934), the production and systematic study of artificial transmutations and the new radioactive isotopes that could then be made[38] (e.g. Enrico Fermi who produced the first atomic pile in 1942), and exploration of the properties of nuclei.

Guided by theoretical models this investigation was done along two paths: one based on the classical thermodynamic 'water-drop' model proposed by Bohr, the other a quantum model 'in layers' that described the nucleus in terms of levels of energy, like the atom, with the different states being occupied by protons and neutrons. This path opened up the major chapter of nuclear spectroscopy, while the first path explained the behaviour of heavy nuclei with their large number of nucleons; when these heavy nuclei split they cause nuclear fission, an effect discovered in 1939 by Otto Hahn and Fritz Strassmann for uranium.

Once the heavy nucleus of uranium has absorbed a neutron, it splits into lighter nuclei, releasing energy: Lise Meitner and Otto Frisch explained this phenomenon using the water-drop model. The emission of neutrons during fission, observed by Frédéric Joliot-Curie, Hans Halban and Lev Kowarski, introduced the possibility of chain reactions, thus launching the idea of an atomic pile, for controlled reactions, but also that of a bomb, fulfilling the prediction of the special theory of relativity that 'matter is a reservoir of energy'.[39] Nuclear energy was released during the Second World War in the Los Alamos laboratory in the United States as part of the secret Manhattan Project to develop an atomic bomb before the Nazi regime developed one in Germany; it combined the skills of a large number of physicists, including many

European scientists who had emigrated for political reasons. This was the beginning of atomic energy's dual history – as a weapon in the Cold War arms race, and as a peacetime instrument for the development of nuclear reactors and power stations. A path for producing nuclear energy other than by fission was also opened with thermonuclear fusion; it became a reality with the making of the hydrogen bomb. The search continues for 'controlled fusion', i.e. exothermic synthesis of light nuclei such as deuterium, tritium or helium, from hydrogen. If achieved, this peaceful pursuit would offer the promise of an inexhaustible source of energy.[40]

For scientists to be able to explore the atomic nucleus, whether or not for these applications, they needed great penetration power: at least a few million electron-volts (MeV) of energy radiation,[41] i.e. the degree of magnitude of nuclear binding energies,[42] first supplied by radioactive bodies and by the acceleration of protons and light nuclei in electrostatic machines (accelerators: Cockroft-Walton, 1930, and Van de Graaff, 1931). Later, higher energy proton and electron accelerators made it possible to obtain elementary particles.

### Elementary particles

Nuclear physics and the study of cosmic radiation (discovered in 1912 by Victor Hess) gradually gave rise to the physics of elementary particles and discovery of a whole series of naturally accelerated particles, from 1930 on. After the electron, proton and photon came the *neutron* and the *positron*, the anti-particle of the electron as postulated by Dirac's theory;[43] then from 1936 to the late 1940s, the *muon* (a sort of heavy electron) and the *p meson* (predicted in 1935 by Hideki Yukawa in his theory of nuclear forces and finally observed in 1947). Next came 'strange particles' and the first 'resonances'. After this, accelerators reaching ever-higher energies (cyclotron, synchrotron and even supersynchrotrons and large electron and positron colliding rings) produced a large number of new particles by penetrating ever further into the fine structure of nuclear matter.

As a result, nuclear physics and elementary particle physics then became two quite distinct disciplines: the first focused on the structure of nuclei and their binding forces in a field where energy levels are relatively modest,[44] while the second targeted research into the elementary constituents of matter, to identify them and analyse the dynamics of their interaction. From an experimental viewpoint, particle physics featured a constant increase to ever-higher energies.[45] By the 1950s, the field was being referred to as high energy physics and ranked on the same level as subnuclear or elementary particle physics.

### The three interacting fields of subatomic particles

The study of nuclear reactions of nuclei and particles demonstrated a set of dynamic interactions different from those observed in an electromagnetic field:[46] the 'strong interaction' force, or more accurately nuclear force, is responsible, *inter alia*, for the cohesion of the nucleus, binding the protons and neutrons together, while the 'weak interaction' force is responsible for ß decay. These force

fields were the subject of major theoretical studies starting in the mid-1930s. Fermi took an hypothesis formulated by Pauli on the existence of a neutral particle with zero (or virtually zero) mass – the 'neutrino' – released in ß decay, and developed a theory of radioactivity. Subsequently a part of this theory was integrated into the theory of weak interactions, based on the quantum field theory developed for quantum electrodynamics.[47] However, in 1935, Hideki Yukawa submitted his theory of nuclear forces postulating that a particle of mass, intermediate between the electron and the proton, i.e. the meson, is exchanged between nucleons: the discovery of the $\pi$ meson in 1947 (a particle which exists in three states of charge) confirmed the validity of this approach.[48]

The properties of elementary particles concealed in nuclear matter were characterized by their behaviour in these three fundamental interactions. The quantum numbers that defined the states corresponding to these particles are in transitions between the different states, covered by conservation or selection rules depending on the type of interaction involved. In the degree of intensity (measuring force) and invariance (or conservation), being higher or lower, the interacting fields follow a hierarchy: strong, electromagnetic and weak, which means that a distinction can be made between stable (and relatively stable) particles and metastable particles or 'resonances'. Resonances decay very quickly through strong interaction:[49] these are the excited states of hadrons, the term used for any particle subjected to a strong interacting field.

The discovery in 1957 of the 'non-conservation of parity'[50] (left-right asymmetry) in ß decay, and also the decay of particles in a weak interaction, led to Fermi's theory being modified and generalized, while still retaining the validity of its structure: further work elucidated the concept of 'currents' (particles being transformed in interaction) and paved the way for later work done on symmetries.

Between the late 1940s and the late 1960s, hundreds of hadronic particles were discovered, both fermions (e.g. nucleons, known generically as baryons) and bosons (generically mesons).[51] The establishment of their spectroscopy as a function of characteristic quantum numbers (spin and parity, isospin, 'strangeness') uncovered regular features in their properties, making it possible to rank *them as state multiplets*, characteristic of a rule of symmetry for hadrons: *SU(3) symmetry*. The theory of groups of representations meant that by studying the mathematical properties of the phase changes they could be considered as combinations of other more elementary states, called 'quarks'.[52] Each of these quarks had its own characteristic quantity (high *isospin*, low *isospin*, *strangeness*), later generally referred to as *flavour*.[53] By 1962 three quark flavours were needed to cover all known hadronic particles; three decades later the discovery of families of particles of different flavours[54] meant the number had grown to six.[55]

These representations still only corresponded to the mathematical properties of the quantum states of the particles, which alone could not make them *physical* particles. However they did provide a simple theoretical understanding of the particles' properties of 'internal symmetry'.

After *hadrons* in the classification of elementary particles, came *leptons* and *photons*, both without strong interaction. Leptons (fermions with spin ½) included the electron ($e$) and the muon ($\mu$, a sort of heavy electron, first observed in 1937 in cosmic radiation), and their respective neutrinos, $v_e$

and $v_\pi$ (these being electrically neutral states). The neutrino-electron conjectured by Pauli in 1930 had been detected through its interactions by Frederick Reines and Clyde L. Cowan in 1953–56, working with a nuclear reactor. The independent existence of the neutrino-muon was confirmed in 1962 in a particle accelerator. A third pair of leptons appeared later, in 1977, with the identification of a charged 'heavy lepton' $\tau$ (together with its tau neutrino $v_\pi$). The photon ($\gamma$, zero-mass boson) was the quantum exchanged between charged particles interacting electromagnetically. Before long it was joined by other 'exchange bosons' from other interacting fields.

Experiments in scattering leptons (electrons, muons and neutrinos) and photons (all particles with no strong interaction, for which hadronic matter is relatively transparent) on protons and neutrons showed (between 1967 and 1973) that these *nucleons* had an internal structure shaped like hard seeds or *partons*, seen as the equivalent of the *quarks* in the symmetry groups. These quarks were therefore the *elementary physical constituents* of hadrons, which meant considerable simplification of hadronic physics, reduced to the properties of quarks, either bound or in interaction. But it was still impossible to extract and isolate them from the nuclear matter (to date no fractional charged particles have ever been observed): when excited, they recombine among themselves within the nuclear matter and produce ordinary hadronic particles.

The spatial dimensions of particles covered by particle physics range from the size of nucleons (a few $10^{-13}$ cm) to the upper limit of particles considered to be 'punctual', i.e. quarks and leptons ($10^{-18}$ cm), and the mass spectrum of elementary particles is spread quite evenly from zero (for the photon, and for a long time accepted as the threshold for the neutrino $v_e$) and 0.5 MeV (the electron), through a few GeV (for particles known in the 1960s), right up to hundreds of GeV since the 1980s.

### The structure of atomic nuclei

Throughout this whole period nuclear physics was continuing its investigations into the properties of atomic nuclei using two complementary approaches. The first analysed the overall behaviour of the set of nucleons, and the second focused on the properties of the nucleus seen as the sum total of the individual behaviour patterns of each of its component parts. The connection between collective motion and individual motion in the nucleus of the atom, which had been studied both experimentally and theoretically, had made it possible, *inter alia*, to describe the non-symmetrical configuration of the nucleus.[56]

The use of the first accelerated beams of heavy ions (starting in 1966) expanded the scope for studying nuclear reactions by providing access to levels of high angular momentum, and increasing possibilities for synthesising new and remarkable isotopes known as *exotic nuclei*, as well as *super-heavy elements* with atomic numbers higher than any previously known on the periodic table (extended to Z=112 in 1996). Heavy nuclei possess a large number of tightly packed energy levels with some even overlapping for high energies: the elimination of discontinuities meant (as with the water-drop model) that statistical mechanics and classical thermodynamics could be applied to them. This global analysis for collective phenomena, such as fission or

the formation of a compound nucleus, originally developed in nuclear chemistry. It was then generalized as nuclear macrophysics, with the study of collisions between two complex nuclei. Collisions of heavy ions also opened the way to another state of nuclear matter, where borders between individual nucleons were broken down, and where nuclear matter is seen as being comprised of free quarks and gluons, forming a *plasma* confined within the dimensions of the range of the strong interaction.

Certain aspects of recent developments on this and the concept of *nuclear matter* will be discussed below.

## Gauge symmetry fields and the 'Standard Model'

Another area of greatly expanded knowledge concerns the interactions of elementary particles. By the 1970s it was clear that the three force fields could be understood within the general framework of quantum field theory, previously thought to be restricted solely to the electromagnetic field. The theory of quantum electrodynamics, as proposed in 1947 by Richard Feynman, Julian Schwinger, Shin Itiro Tomonaga and Juan José Giambiagi, made it possible to determine the quantities involved in electromagnetic phenomena by a calculation of 'perturbations' reduced to convergent series, measured using the approximation required.[57] The greatest difficulty, which was the appearance of infinite quantities in the series development, had been resolved by a 'renormalization' procedure. This procedure was able to eliminate these quantities by an appropriate transformation related to the 'gauge symmetry' of the electromagnetic field, that symmetry itself being related to the zero mass of the photon, the quantum responsible for the electromagnetic coupling. The electrodynamic theory could then be used not only to calculate the value of the physical quantities, such as the mass and electric charge of the electron, and to do so with great accuracy, but also to explain new phenomena such as the Lamb effect.[58] The degree of theoretical and experimental accuracy also provided a limit to the spatial extension of the electron and of other 'punctual' charged particles such as leptons and quarks.

For a long time the properties of the other two types of interaction were an obstacle to any prospect for study by a similar theoretical approach. The punctual nature of the weak interaction required a quantum propagating the field to have mass too large for renormalization to be possible, and the high 'coupling constant' of strong interaction meant there was no hope of limited series developments. For a long time, both types of dynamic interactions between nuclear or elementary particles remained the subject of phenomenological studies, both theoretical and experimental. This debate thus paved the way for new syntheses developed since the 1970s, which would attempt to integrate and unify the fundamental forces within a single overarching theoretical framework.

This new approach was made possible first with the theoretical work being done on gauge symmetry fields, and secondly with the reduction of strong interacting particles into more elementary constituents – namely quarks, or punctual particles; this simplified the couplings of particles with the interacting fields. The role played by the electric charge in weak interaction appeared to be played by the quantities of weak charges characteristic of lepton and

hadron currents in interaction, and generically referred to as flavours. For strong interaction, the role seemed to be played by a quantity called colour,[59] which appeared as a constituent of quarks, and seemed able to bind them together.

The basic idea of gauge field theories is that the dynamics of particle interactions are determined by a property of invariance or symmetry of the quantities characterizing them: for weak interaction, the symmetry is related to weak charges or flavours. The electroweak gauge theory of Sheldon Glashow, Abdus Salam and Steven Weinberg (1967–68) sees electromagnetic and weak fields as simply components of a single field, described as 'electroweak'; it is symmetrical (or invariant) at very high energy with respect to 'local' gauge transformations viewed as an extension of the 'global' gauge of the electromagnetic field. Four field quanta (or bosons) are needed, two charged and two neutral, the neutral ones being mixed (as in quantum superposition); all of them in this state of exact symmetry, must have zero mass.

However, in weak interactions at the energies studied, this was impossible because the weak bosons, which had not yet been observed then, had to be of very high mass. Work then turned to a mechanism for breaking exact symmetry, known as the Higgs mechanism.[60] While separating weak and electromagnetic interactions, it assigned high mass to the three weak interaction bosons while retaining the zero mass of the photon. It was shown that renormalization of the component parts of the weak interacting field ultimately remained intact in this process, making it possible to make finite calculations of physical quantities.

The theory made a number of predictions, the two main ones being the existence of previously unobserved weak neutral currents (which are, as it were, the weak counterpart of the neutral, electromagnetic currents between the particles[61]), and the existence of three intermediate high mass bosons. The theory introduces a 'mixing' parameter between weak and electromagnetic fields, which is factored into theoretical predictions. Neutral currents were observed under experimental conditions in 1973, in the giant Gargamelle bubble chamber placed in a beam of neutrinos at CERN (Plate 71).[62] Their rate, linked to the electroweak parameter, suggested very high masses for the intermediate bosons, in the vicinity of 80 GeV (more than 80 times the mass of the proton). The three weak intermediate bosons, two charged ($W^{\pm}$) and one neutral ($z^0$), were produced and identified in 1982 with proton-antiproton colliding rings specially developed for this purpose at CERN.

After the success of the electroweak gauge theory, strong interaction was then studied in terms of gauge fields, which gave rise to the theory of quantum chromodynamics, developed from 1974 on. The punctual nature of quarks and their known properties shed new light on the structure of the strong interacting field: as the distances got tinier, their ability to interact faded to the point of disappearing. This asymptotic freedom provided the possibility for calculating series of perturbations. But their 'confinement', i.e. the impossibility of extracting them, was interpreted in quantum terms by a superposition of states which could not be dissociated or escaped from, and assigned to a quantum number, referred to as colour, which had to be introduced. Each ($q$) flavour quark[63] is itself a superposition of three different colour states, $q_1$, $q_2$ and $q_3$. Colour only plays a role in strong interaction, which is, however, invariant for

flavours. In fact, 'colour' can be understood as the 'strong charge' in the field carried by intermediate zero mass bosons, eight in number and electrically neutral, the *gluons*, colour field quanta exchanged between two quarks in their interaction.[64] Chromodynamics has proved very useful for conducting experiments in high-energy hadronic physics.[65]

## Prospects for further unification

The larger body formed by the electroweak theory and chromodynamics includes most of the theory of elementary particle physics and has been accepted as a standard model. Each of these theories has considerably simplified representations in its own domain, with one single explanation covering previously separate phenomena. But the theories do introduce 'free' parameters, i.e. produced solely through experimentation. What's more, while there is a relation between the two theories, they do remain fundamentally independent of one another. Ideas involving field symmetry have raised hopes of also being able to extend or unify ideas in greater symmetry, making it possible to go beyond these limits and reach a rational understanding of facts simply observed to date, such as the parallelism between the three families of quarks and leptons,[66] or the values of their masses.

In this way, work on unifying the three interactions has proceeded. The gauge symmetry that governs field equations is valid from a fundamental viewpoint, even though it remains hidden because it is not displayed directly in the phenomena observed (e.g. particles have masses which are all different, whereas the perfect symmetry joining them requires zero mass). Exact symmetries are only confirmed when masses (the result of symmetry breaking) can be overlooked: theoretical thought has therefore moved towards the domain of higher energies. The goal is a 'grand unification theory' where the three fields mentioned here converge, for example, merging quarks and leptons. This could mean coming back to the idea of a gravitational field, which has been sidelined, but will nonetheless have to be taken into account. The general theory of relativity would then give way to a quantized theory. An important first step in this direction has come from 'supersymmetry' theories. These mix fermions and bosons, or super strings with particles no longer seen as discrete points but as objects in space having more than four dimensions, and with the additional dimensions being folded in on one another.

## New trends in subatomic physics

By the 1980s, *nuclear physics* and *particle physics*, the two previously diverging branches that grew out of atomic physics, had begun to move back towards one another, not only in terms of their techniques and methods (producing differentiated beams at high energies, detecting complex interactions), but also through the nature of the subjects studied. If we think of the quark structure of matter, for example, the distinct borderline between the constituents of nuclei and particles has obviously become blurred. Nuclei and particles undergo the same fundamental interactions in systems, which are not always very different. Both fields include the study of neutrinos and are attempting to detect any 'oscillations' or spontaneous transformation from one

form into another; the findings have combined data from experiments conducted in both domains. The neutral currents of the weak interaction also exist in the nuclear domain and, indeed, also in atomic physics. The physics of hadrons is part of both nuclear physics and particle physics. These common concerns and the overlapping of subjects offer an incentive to see nuclear physics and particle physics as basically comprising the same discipline, i.e. subatomic physics. In their most differentiated parts, one focuses on research into the elementary and fundamental – as seen with the reduction of elementary particles and gauge fields – whereas the other focuses on nuclear matter in its complexity.

In nuclear physics, the concept of the nucleus (with its discrete levels of energy and the individual behaviour of the nucleons) has been replaced by the more general concept of nuclear matter with a diversity of structures, bound or unrelated, in ground state or excited, and covering not only nuclei and fragments of nuclei studied on Earth, but also compact celestial objects as big as neutron stars. The thermodynamics of ordinary matter (adapted to quantum conditions) has been applied to nuclear matter so as to account for properties at equilibrium or far from equilibrium. The theory shows two phase transitions: the first, similar to transformation from liquid to gas, has the atomic nucleus losing its identity by simultaneously emitting the nucleons comprising it; in the second, at very high energy, the nucleons themselves lose their identity in a plasma of quarks and gluons analogous to the ion and electron plasma of atom gases at high temperature.

Another highly significant convergence of disciplines to be discussed is that of nuclear and particle physics with astrophysics and cosmology.

## ASTROPHYSICS AND COSMOLOGY

Astrophysics first emerged in the nineteenth century when observation of the visible spectra of stars made it possible to identify their chemical elements. In the twentieth century the description was expanded, bringing new knowledge about the structure of matter. The equivalence of mass and energy quickly pointed to the idea that atoms might have arisen through a genesis process originating with the very simplest one – the hydrogen atom. Nuclear physics and knowledge of the properties of nuclei provided support for this idea, and the apparently inexhaustible source of energy in the Sun and stars was soon identified: it was, quite simply, nuclear reactions with light nuclei fusing into heavier nuclei. It could be said that the stars were ovens where the cosmos synthesized chemical elements that underwent changes in the course of time: the life and death of stars is directly attributable to competition between their tendency to collapse under gravitational force and the centrifugal pressure from the energy released in nucleosynthesis reactions. Advances in radioastronomy (radio, infrared, X-rays and gamma rays) have taught us still more about the properties of the stars and identified new celestial objects of various kinds, from radiogalaxies (discovered in 1953), to quasars, pulsars (in the 1960s) and intense sources of radiation.

In parallel, over the first decades of the twentieth century, astronomical observations provided more accurate knowledge of the galaxies, measured their luminosity, estimated distances and calculated the number of stars – an

average of 100 billion per galaxy. Cosmology, drawing on both the general theory of relativity and observation of distant regions of the Universe, had developed as a science in its own right; its main focus was the Universe, seen as a whole with its own structural make-up and evolution. While the vast structures of cosmology are concerned with the gravitational field, the elements and local sub-structures are the focus of astrophysics. The two have moved closer together over recent decades with the establishment of a standard model for matter and the Universe. It combines the model for the physics of fundamental interacting fields discussed above, and the model for evolutionary cosmology, known as the big bang.

## Astrophysics, stellar matter and new cosmic objects

As a consequence of their mutual gravitational fields, atoms in the same area of space gather together and 'fall' on top of one another: this is how stars and planets are formed. For a mass of matter in sufficient quantity (from slightly below one solar mass), the strong gravitational field compresses the atoms. They lose their electrons, forming a plasma where colliding nuclei (of hydrogen or helium for first generation stars) start a series of nuclear reactions forming heavier nuclei, which then, in turn, collide. In 1939, Hans Bethe submitted his theory of the fusion cycle; in it hydrogen is converted into helium, also producing neutrinos in the stars, and ultimately synthesizing carbon and then oxygen (Bethe-Salpeter cycles).

Stellar cycles include stable phases where combustion energy counters the gravitational force and gravitational compression phases when the stars cool down after they have exhausted their fuel: the density of the nuclei triggers new nuclear reactions producing heavier nuclei, and so it goes on until iron is synthesized. The lifetime of a star and its final state depends on its mass and density. Observation of new objects in cosmic space has provided a greater understanding of the different stages in the evolution of the stars: when compressed to extremely high densities, they are white dwarfs (gravity is balanced by the degeneracy pressure of the electrons, a directly quantum effect), brown dwarfs[67] (very dense but with mass too low to trigger combustion reactions), pulsars or neutron stars (observed for the first time in 1967, and with 400 now identified in our galaxy[68]), novae (a sharp, temporary increase in brightness), supernovae or extremely violent explosions with luminous flashes some ten billion times brighter than the Sun[69] (e.g. '1987A', which could be seen with the naked eye in 1987 in the Large Magellanic Cloud and emitted neutrinos detected on Earth), and black holes, so massive and dense that no light or radiation can escape from them.

Stars explode across space sowing nuclei of heavy and medium-weight elements. When they re-form, they, in turn, produce second-generation stars, and so it goes on and on. Space also contains cosmic rays (protons or nuclei) and gamma rays from sources that can be situated: these particles are usually the result of violent phenomena in the Universe, such as the activity of galactic centres or the explosion of supernovae.

Observational astronomy using optical and radio telescopes was recently strengthened by neutrino-astronomy, which uses neutrino detectors[70] to catch neutrinos produced in the stars (primarily in the Sun) and in the different cosmic phenomena. The ability of neutrinos to penetrate matter make them ideal for probing opaque objects in the Universe. Neutrinos emitted by the Sun are detected on Earth but found at a level that falls short of predictions. One explanation could be the spontaneous transformation of these neutrinos ($V_e$) on their path to Earth, forming a neutrino of a different family that may not be able to produce the corresponding lepton (which is heavier than the electron) and would remain 'sterile' instead of interacting in the detector.

Other outstanding celestial objects of a quite different nature are the extra-solar planets that are difficult to detect because of their distance, although towards the end of the twentieth century a number of these were finally detected both by direct means (visibility) and indirect means (effects of gravity on their star); and quasars, which are very intense, but very distant sources of light and more directly related to cosmology.

## The cosmology of an expanding universe

When developing his concept of general relativity, Einstein focused on the link between inertial mass and other masses in the Universe (Mach's principle); he then established the dependence of the metric structure of space as a function of the masses and energies it contained (sources of gravitational fields). In doing so, Einstein linked the idea of cosmology to the foundations of his physical theory. It was the general theory of relativity that determined the beginning of cosmology as a science: in 1917, Einstein raised the question of the conditions of the limits for relativistic space-time, i.e. the nature of space beyond the domain determined by gravitational fields. To avoid reintroducing absolute space in regions devoid of matter and extending infinitely, he had to accept – or so he thought – that the curved space of the Universe as a whole was closed. In geometry, Riemann had already dissociated the finiteness of space from its limits: finite spaces can be considered as having no limits, e.g. the two-dimensional space of the surface of a sphere.

Einstein then came up with the idea of applying his theory to the entire Universe, and of looking for solutions using simplifying hypotheses according to 'models' of the Universe. He devised the hypothesis of a 'cosmological principle', featuring homogeneity and isotropy in the distribution of the density of matter in the Universe; assuming that the radius of the Universe does not change with time, he introduced a 'cosmological term' that counterbalanced the impact of gravity. Alongside this cylindrical model of the Universe devised by Einstein, Willem de Sitter proposed a spherical model. Then in 1922 Alexander Friedman came up with the idea of a non-static universe, which was confirmed some time later with observations of the recession of the galaxies, and which Einstein eventually had to accept.

From an observational viewpoint, cosmology gradually established itself: by producing accurate calculations of astronomical distances, by realizing there were other galaxies well beyond the Milky Way, by observing the red shift of their spectral lines (Slipher, 1920), by calculating their distances (Edwin Hubble, 1920–30) and the proportional relationship between the spectral shift and distance, as formulated by Hubble in 1929 (Plate 72). Hubble's law (or the Slipher-Hubble relationship) indicated a mutual moving

away or recession of the galaxies.[71] Arthur Eddington interpreted it in the context of general relativity as observational proof of the Universe expanding, while Georges Lemaître, in 1930, presented his model of the primitive atom. In his view, the atom had exploded, giving birth to the Universe as we know it today and thus causing the galaxies to recede.

The theory of the expanding Universe was given spectacular confirmation in 1965 when Arno Penzias and Robert W. Wilson made the chance discovery of radiation at centimetre wavelengths in the cosmic background: isotropic radiation corresponding to the radiation of a black body at a temperature of 3 Kelvins. Such radiation had actually been predicted, in qualitative terms, by George Gamow in his hypothesis of a very hot Universe at the beginning of its expansion (the model now referred to as the big bang or 'primordial explosion').

In addition to these two major 'cosmological facts' – the recession of the galaxies and residual radiation – there was a third one concerning the *abundance of light elements* (De, He-3, He-4, Li) in the Universe that were stored in the stars. Their abundance was relative to the quantity of hydrogen.[72] Stellar nucleosynthesis alone could not explain the values observed, although they did tally with the predictions deduced from a state of great heat in the primordial Universe (primordial nucleosynthesis). The corresponding period had to have been very short because of the extremely fast cooling of matter as it scattered across the expanding Universe, for lower density meant that heavier elements could not be synthesized.

The general theory of relativity constitutes the framework needed to support cosmological theory; however, the exact form of the equations and the values of the solutions depend first on the simplifying but reasonable hypotheses used (e.g. the cosmological principle), and secondly on the parameters based solely on observation. Friedman's simplified cosmological equations, expressing the radius of global curvature of the Universe as a function of time, have three types of solution depending on the average value of the density ($\rho$) in relation to a 'critical density' ($\rho_c$).[73] The critical density is an exact compensation between the expansion and gravitational attraction of the constituent parts of the Universe. For any density less than critical density, the Universe is 'open' and expanding indefinitely; for any density greater than critical density, at a certain moment gravitational attraction will prevail over the expansion and the closed Universe will re-form, after reaching a maximum radius, moving towards a 'singularity'[74] symmetrical to the singularity of the primordial Universe.

Data from observational cosmology has provided us with information about the age of the Universe. This input can help make the theoretical model more accurate, with the prospect of forecasting the future evolution of the Universe. The value of Hubble's constant, depending on the value chosen,[75] sets the age of the Universe at between 10 and 17 billion years.[76] While the value of the average density estimated from the visible Universe is much less than the critical density (by a factor of approximately ten), it is also known that it is less than the real value that can be observed through the effects of gravitational force (the interaction of galaxies). In other words, the Universe contains 'dark matter' that is not visible, and the problem of determining this 'missing mass' is now one of the most important challenges for modern cosmology and astrophysics. This

missing matter may be quite diverse in nature: massive black holes of non-zero mass of 'fossil' neutrinos in the cosmic background, produced at virtually the same time and in the same quantities[77] as the isotropic electromagnetic radiation or 'exotic' particles[78] created at the very beginning of the cosmos' expansion and in sufficient numbers and with enough mass to constitute a predominant share of the energy and mass in the Universe.

This cosmology, backed by its fundamental theory (general relativity) and observational data which generally supports the hypotheses of expansion and the big bang, is today quite well established and has been endorsed and recognized as a standard cosmological model.

## The origin of the Universe

In its very early phases ('the first instants') evolutionary cosmology includes conditions that greatly restrict spatial dimensions and require extremely high energy density and temperature, equivalent to the conditions studied in research into subatomic physics (nuclear and particle physics). It pays special attention to that region where symmetries of interacting fields are increasingly close and where there is effective unification. Symmetries have been broken, fields differentiated and masses of particles have appeared as we move down the cosmogenesis timeline, with each period featuring a type of unification or differentiation of fields and of plasma of matter and radiation.[79] Next, continuing through time towards the present, we discover organizational forms emerging that are more familiar to us, forms such as galaxies (appearing around one billion years ago) of gas, dust, stars which form and fade, and other cosmic objects.

Cosmology thus offers an all-encompassing and coherent version of the genesis of the Universe and the objects it contains. It is reasonable to think that the Universe – in line with the implications of the general theory of relativity, of relativist and quantum cosmologies, as well as astronomical and astrophysical observations – has deployed its space and time in the movement of its own expansion, as space and time are not defined outside the matter comprising them. One of the most striking aspects of this theoretical representation is the intersection of the cosmology of the first instants and unified gauge field physics, and their convergence. This convergence began in the 1960s when it was realized that the two disciplines – one focusing on the distant cosmic background and the other on the innermost depths of the microcosm – were in fact one and the same. This convergence has continued to grow and the standard model discussed by cosmologists and physicists is now the juxtaposition of the model of unified gauge symmetry fields in particle physics and the big bang model in cosmology.

What then remains at the furthest point going back in time? It could be a mathematical singularity (a point with no dimensions, of infinite density), if arguing by extrapolation from the model developed from the general theory of relativity. But that theory is not the only one in these areas, where the other fields expressing the quantum structure of matter were actually dominant. Yet looking beyond the phase where the grand unification field dominates, i.e. times below a specific value known as 'Planck's time' ($t_P = 10^{-43}$ s), the gravitational field then recovers its value, playing a role as important as others, i.e. quantum matter fields, and it is thought that the gravitational field could be

unified with these. But the theory of the gravitational field under these conditions of space and energy needs to be transformed to comply with quantum conditions. Such a theory of quantum gravitation still defies efforts in theoretical research. This means we do not know the laws of physics for the period beyond Planck's time, and therefore that the concept of time has no physical meaning for us below that value. To persist in discussing time as if it were a continuous quantity, indefinitely divisible, is then nothing more than convention; and there is no proof that this same concept of time would be retained in a quantum theory of gravitation should it be achieved. In these circumstances, any reference to zero time is quite meaningless, for here we are grappling with the limits of our ability to even conceive of an origin of the Universe.

## MOLECULAR BIOLOGY

### Redefining the nature of living systems

The twentieth century witnessed three major scientific revolutions. In physics, the classical paradigm was questioned and two new schools of physics were established at opposite ends of the scale of magnitude: quantum physics and relativistic physics. The second revolution occurred in biology and led to the nature of living systems being redefined. The third revolution was the invention of the computer and the birth of information technology (Plate 73). The three revolutions were not independent: the revolution in physics provided inspiration for upheavals in biology; information technology (IT) and molecular biology emerged at the same time; and molecular biology adopted the metaphors of IT.

The development of life sciences in the twentieth century proceeded by stages: the early decades saw the development of two new disciplines, genetics and biochemistry, which laid the foundations for the new biology that first emerged in the 1940s. As was the case for physics, the revolution brought greater control over certain aspects of the world – especially towards the end of the century with its application to biotechnologies, molecular medicine and gene therapy. This new vision of the living world was named 'molecular biology'.

### The Birth of Molecular Biology

Many and varied are the arguments presented to explain the spectacular development of biology in the twentieth century, and many and varied are the models presented to account for the scientific 'phenomena'.

An inward-looking view of scientific development based on the interaction between models devised by scientists and observations obtained through advances in technology – constantly shifting and going deeper (or more accurately to ever more elementary levels of organization) – sees the boom of molecular biology as simply the completion of a movement first begun in the Renaissance, at the dawn of the scientific revolution. In this worldview, life sciences were established in the seventeenth and eighteenth centuries (although the term 'biology' was not coined until the nineteenth century); their goal at the time was to explain the properties of living beings. This meant analysing the complexity of biological phenomena, breaking them down to their simplest elements. In parallel, the movement contributed to the discovery of the hierarchical organization of the structures that comprise living beings. In the seventeenth and eighteenth centuries physics had set the example. By the middle of the nineteenth century, encountering difficulties associated with an excessively mechanistic description of living organisms, biologists had chosen chemistry as the indispensable partner in their work. At the same time, the invention of more powerful microscopes in the nineteenth century led to the development of cell theory. But biologists did not stop at that level of complexity: they went beyond the cell to discover the remarkable properties of the cell nucleus and then of the chromosomes inside. And in the meantime, the catalytic properties of enzymes had been slowly uncovered, explaining the amazing chemical properties of the cytoplasm.

The twentieth century simply took this characterization of the fundamental components of living organisms a step further. Chromosomes proved to be gene containers, and the young science of genetics showed the fundamental role they played in determining heredity. This branch of science, which should be credited to Gregor Mendel, the nineteenth-century Russian monk, was not understood and used until it was 'rediscovered' in the early twentieth century. Genetics benefited from the dynamic impetus of Thomas Hunt Morgan's research team at Columbia University in New York City. Using just one organism as a model, the fruitfly (*Drosophila*), Morgan and his team showed that genes were located on chromosomes (Plate 74). This observation allowed them to create the first genetic maps. Other groups extended these findings to different organisms, both animal and vegetable. Genetic analysis was becoming increasingly accurate, and the localization of genes on chromosomes was becoming ever more reliable; however there remained much to learn about the nature and functioning of genes. At the same time, the characteristics of enzymes were being documented; they were identified as proteins, and painstaking work to determine their structure began. Molecular biology emerged in the 1940s when these two experimental approaches combined both their techniques and questions, and when the chemical nature of genes and their role in protein synthesis were determined.

For anyone who believes that the development of science is mostly a response to external forces, the boom in molecular biology would appear as a response to problems affecting industrial society in the early twentieth century. On the one hand, advancement of science, particularly physics, gave us technology and its control of the inanimate world; and with it there is continuing economic growth (at least in industrialized countries). Yet on the other hand there are social and health problems associated with mental illness, crime, tuberculosis and sexually transmitted diseases – afflictions often passed on from one generation to the next. Faced with these challenges, it was tempting for some (the eugenicists) to take the findings of studies into hereditary conditions and apply them in full to reverse the supposed deterioration of human germ plasma. Another response was advocated by members of the Rockefeller Foundation, liberals determined to combine industrial progress and social progress. These enlightened minds believed biological sciences should catch up with the physical sciences. Deeper knowledge of living organisms, they claimed, would

inevitably enable us to more successfully control problems affecting the biological foundations of human society.

The role of the Rockefeller Foundation in the rise of the new biology has been the subject of lengthy debate. Some believe it was fundamental, combining pro-active work with financial incentives that attracted physicists to molecular biology – encouraging them to devise new techniques and technologies to study living organisms, and helping them equip their laboratories accordingly.

This view is no doubt far too geographically limited, for the same trend is found in all countries where biological research had reached a similar level of development (e.g. the USA, France and the UK). Surely the Rockefeller Foundation was not so much the driving force as simply supportive and attentive to those who saw the future development of biology in using both the concepts and tools of physics.

Whether through its own development or through a deliberate choice made by political and economic decision-makers, it is clear that everyone saw how future advances in biological knowledge could be achieved through the application of physical theories and techniques, by focusing on the elementary constituents of living organisms and their complex macromolecules.

Molecular biology emerged triumphant from the meeting of such diverse disciplines as biochemistry and Morgan's genetics. No one today would challenge the molecular view, but that was certainly not always the case. In neither the Soviet Union nor Eastern Europe was genetics accepted until after the Stalin era. Lyssenko (1898–1976), a fanatic anti-geneticist, even succeeded in having genetics dismissed as a 'bourgeois science', promoting instead a vague pseudo-scientific theory influenced by Lamarckian ideas.

Domestic and foreign political considerations in the Soviet Union explain much of Lyssenko's success. Morgan's genetics also faced opposition in many countries, including the United States, France and Germany. Genetics stood in opposition to other biological disciplines such as embryology, yet gave no explanation of the role of the genes in the development of the embryo. It was not until the 1960s that molecular biology began to produce models able to meet the demands of developmental biologists.

### Stages in the molecular revolution

The main discoveries that helped establish the new view of living organisms occurred in the period between 1940 and 1965. They arose from the choice and construction of model systems for studying the fundamental relationships among the constituents of living organisms. In the first half of the twentieth century, the fruitfly had contributed to the growth of genetics, but micro-organisms, and in particular the common intestinal bacteria named *Escherichia coli*, provided the optimal test organism for molecular biologists. For a long time doubt had persisted as to whether these elementary organisms possessed genes, but this was dispelled when the mechanisms of genetic action and their role in coding proteins were uncovered thanks to these micro-organisms. The molecular revolution was also built on the use of new tools: while there were electronic microscopes, the images they captured were often difficult to interpret; the techniques of physical and organic chemistry could be used to isolate the macromolecules in living organisms, and specifically in

proteins, highlighting how the composition and structure play an essential role. Nuclear physics contributed by providing the isotopes of the main atoms that make up the macromolecules in living organisms and offering options for tracking transformations of these molecules, either in samples or inside the cells and living organisms.

The combined use of models and techniques between 1940 and 1965 helped illuminate the basic molecular mechanisms that control the functioning and reproduction of living organisms. In 1940, unequivocal proof was given of the clear relationship between a gene and a corresponding enzyme (a protein): the relationship had been inferred since the early twentieth century, but by using one micro-organism (a fungus, *Neurospora crassa*) it could be generalized. In 1944, O. T. Avery et al. showed that genes were made of deoxyribonucleic acid (DNA). This finding was in direct opposition to previously accepted ideas. The structural and functional diversity of proteins were already well known, so proteins were chosen for investigating the chemical nature of genes. Eight years after Avery's experiment, a second experiment was conducted on the bacteriophage to show that the genetic material did indeed contain DNA; then in 1953, J. D. Watson and F. Crick discovered the double helix structure of DNA. This was immediately acclaimed for the 'beauty' of the structure and because it provided a simple explanation for the self-replicating properties of genes. The code was deciphered between 1960 and 1965, when scientists finally understood that a protein corresponds to one specific fragment of the DNA molecule, called the gene. Over the same period, regulatory mechanisms controlling enzymes, proteins and genes were identified. Once these regulatory models had been constructed, molecular biologists could, with complete faith in their explanatory diagrams, move away from the study of micro-organisms and embark on the study of complex multicellular organisms and their development, i.e. their gradual formation from a single cell.

### Moving towards the study of complex organisms

Over the next ten years, molecular biologists studied the complexity of these multicellular organisms, but with little success. The period between 1940 and 1965 had provided biologists with a fine framework for interpreting basic phenomena in the living world. However the tools developed to study micro-organisms proved unsuitable for complex organisms. With research at a standstill, existing models were discarded and other, more complex models were devised, but again without success. This period of doubt and questioning must have been necessary for molecular biologists to realize just how complex the levels of organization were inside living organisms – molecules, organelles, cells, tissues, organs and organisms.

Doubts and questioning of models continued until the tools of genetic engineering eventually provided the long-awaited resources. The discovery of restriction enzymes that can cut the DNA (genes) at specific points has often been cited as marking the birth of genetic engineering. Genetic engineering is, in fact, a complex range of techniques used to: (a) isolate genes; (b) make fine characterization (determining the sequence of proteins they code for); (c) make transfers from one organism to another (with the possibility of producing transgenic animals and plants, i.e.

with new genes integrated); and (d) modify or mutate them to change their function or regulation.

The advent of these new tools was greeted with apprehension, first by biologists and then by the general public. There were questions concerning the risk of spreading pathogenic genes in the wild and to the human species, and whether a natural barrier, which had previously separated the species, might be broken down. The decision was for a moratorium on research that was only lifted once very strict measures had been adopted to restrict any danger arising from genetic manipulation. The measures did not put an end to the controversy, however, although favourable reports came in and no accidents occurred. Gradually, the storm settled down and precautions adopted were eased.

With these new tools, information could be collected at great speed which, when presented as findings, would sometimes cast doubt on dogmas in the new discipline. There was the discovery that genes of higher organisms were split into many different pieces; this explained the substantial increase in size of genomes in the course of evolution, although it was difficult to see what advantage had been gained from such genetic complexity. This period of questioning was short-lived, for the mass of data and findings that accumulated using the tools of genetic engineering produced strong backing for the molecular view of living organisms developed between 1940 and 1965.

By 1986, with the volume of findings and the speed at which they were obtained, biologists were contemplating the possibility of determining the complete structure of the human genome. This mammoth task, which could be compared to the Apollo programme to conquer space and put a man on the Moon, raised fears (or hopes) that biology was moving into the 'Big Science' arena. Since the time when the basic concepts were first formed, the programme had changed substantially, not in terms of the ultimate objective, but in terms of organization. Sequencing of the genome had become a final stage, following the mapping of the human genome, offering the possibility of quickly localizing and identifying the genes involved in diseases. More important was the extension, after sequencing the human genome, to sequencing simpler genomes, such as bacteria and single-celled nucleate organisms like yeasts. The first complete genome sequences were determined in 1995 and 1996, no doubt heralding a new stage for biology (Plate 75).

## Biology today

While molecular biology was developing, it was also 'redefining' life. Definitions of living organisms that had been accepted since ancient times gradually receded. The borderline between things living and non-living faded. The distinguishing feature of a living organism was no longer the nature of its constituents or properties, but simply the complexity of its macromolecules comprising it. Aside from the redefinition of life itself, the most characteristic feature of the molecular revolution is the profound unification achieved in the biological sciences. While biochemistry, genetics, development biology and cell biology have retained their own specific features, they all have the same molecular interpretation of the phenomena observed and also share a large number of technologies. The techniques of molecular biology have become indispensable tools for the many other biological disciplines, including population genetics, taxonomy and even palaeontology and ecology.

The new molecular view exposed the deep-seated unity of the living world: unity in the nature of the constituents and also in the rules of the correspondence between the structure of genes and the structure of proteins, rules respected by all living forms known today. This fundamental unity highlights the single origin of all living beings, yet goes beyond the basic constituents behind all primary living forms. What do the structure of a fly and the structure of a human body have in common? Or the compound eye of the fly and the human eye? Yet the same genes are used for both. To explain this strange phenomenon, the French biologist François Jacob chose the metaphor of DIY – do-it-yourself – work. With the passage of time, evolution has worked using the tools available, i.e. the genes ready at hand, using them again and again to build either analogous structures or, the opposite, to build structures that are different but perform new functions. These findings show that to understand the workings of living beings, biologists should not just focus on the structures they discover, but should look to their evolutionary origin. The intention is not to discredit Darwin's model of the evolution of living beings, but the DIY view does provide a counterweight to an excessively 'Pangloss-like' view of evolution, whereby the presence of any structure might be explained in terms of its having some selective advantage. Through its corrective lens, the DIY interpretation shows just how many constraints were involved in the creation of living forms.

The unification that came about with molecular biology has sometimes been held against it, with allegations that it was achieved by downgrading – or reducing – the description of the functioning of living beings to its most elementary level. It is true that in the 1970s certain molecular biologists might have overlooked the organizational complexity of living beings, seeing nothing more than molecular exchanges and interactions. It was thought that individual facts could be memorized and stored in the brain as molecules, just as the genetic memory is stored as DNA. This is no longer the case today, and contemporary biologists have explained living phenomena at the molecular level, after first describing them at a supra-molecular level, as a cell or organism. The 'reductionism' of molecular biology is in fact only partial. Molecular biologists do not set out to produce descriptions at the atomic or electronic level when reporting on interactions between macromolecules, or between proteins and DNA. In most cases, a rough description in terms of mechanisms is sufficient and can even be more relevant.

Physics provides another counterpart to the reductionism of molecular biology. This is particularly surprising for, as we have seen, physics played a major role in the emergence of molecular biology: it provided a model, it contributed both techniques and the scientists who were instrumental in its growth and who, in many cases, had been trained in physics. In the 1940s and 1950s, these scientists dreamed of electronic biochemistry, a biological science as fundamental as its senior discipline. It was thought that cybernetics, the science of controlled systems, based on simultaneous observation of living beings and machines, would inevitably forge the way to designing theoretical models able to account for the physiological properties of cells or organisms. While molecular biologists today still use the concepts of information theory and cybernetics to account for relationships between genes and proteins, it is merely a

metaphor; the complex concepts drawn from information theory (IT) have never found a place in molecular biology.

Why, to this day, do biologists still attempt to describe the most complex regulatory mechanisms using approximate mechanical models without any formalism or equations? Surely there is a weakness in this new biology, which must be corrected if the doors of complexity are to be opened for researchers. In addition to this enduring absence of theoretical biology, there is the disconcerting development of techniques that biologists had temporarily borrowed from physicists. The techniques have now been simplified and made 'democratic'; they can be used without any theoretical or practical expertise in physics. This trend in modern biology stands as a formidable enigma challenging philosophers of science and epistemologists who had built their model by studying physics and had used the historic developments of physics to adopt its evolution as a paradigm for the evolution of all the sciences. Perhaps new biology has simply lagged behind in this evolution, in which case it is high time for it to catch up. Modelling will probably arise 'naturally' with the very rapid acquisition of knowledge achieved through genome sequencing programmes and the ever-increasing use of the IT tools required for this. But it may also be that in a few years' time, developments in physics will appear as applying to that field only (or to a few other disciplines), and that the history of biology may present a different kind of scientific evolution.

While modern biology has not followed the path of physics, it has adopted one of its specific qualities – efficiency. In the past, biologists could only observe living organisms, but today's biologists can act on the organism, and change it. At present the applications may seem trivial: enabling bacteria to produce human hormones, producing a parasite-resistant plant, or mice as big as rats; these are mere curiosities. Quite obviously biologists have not yet mastered all the complexity of living organisms, but their knowledge has already been put to use and small advances may lead to a substantial expansion of the means of action available.

## Molecular biology and beyond

The development of any science is always dependent on other factors. In rational terms, two paths seem to be opening up for molecular biology: one is heading towards an increasingly elementary level of living matter, while the other is returning to complexity by integrating molecular observations. Both developments have been expected for a number of years, and some researchers are waiting eagerly. However, the recent development of molecular biology (which could also be seen as its non-development) demonstrates that caution is required.

Molecular biology has not abandoned its current paradigm, but is still undergoing change. Two related fields of research are expanding rapidly: development biology and evolutionary biology. Development biology has characterized essential genes involved in constructing multicellular organisms and has shown how these genes have been conserved over the course of evolution. The question now raised is whether analysis of these genes will uncover a logic behind the make-up of complex living organisms, or whether these genes are only 'tools' that higher organisms have used to construct themselves, according to rules and logic yet to

be understood and which may only be uncovered at a different level of complexity.

The discovery of 'development genes' will no doubt lead to radical change in prevailing theories of evolution. Darwin's theory must no longer stop with natural selection and the complex interplay of the variation of multiple and non-identified genes. Surely the only genes with variations that are relevant to evolution are precisely these development genes. Surely these are the genes which, when they appeared or were modified, were part of or even *the* reason for the main branches growing out from the evolutionary tree, as for example, with the explosion of living forms observed in the Cambrian period. When defining an animal, instead of attempting to describe properties (e.g. motor skills) as points of reference in relation to organisms that do not have the properties in question, surely it would be more accurate to characterize all the development genes the animal possesses; given their role in the structure of the organism, they are what defines the 'zootype'.

There is, however, one last area of research, which has so far stood up to the attacks of biologists and also artificial intelligence experts, and that is the workings of our brain and cognitive faculties. In the 1960s, after the basic mechanisms involved in the function and operation of living organisms had been established, many molecular biologists saw a new frontier in brain research where they might use some of this recently acquired knowledge. Indeed, Max Delbrück, a founding figure in molecular biology, had set the example when he abandoned his study of bacteriophages to work on a phototrophic fungus, in the hope that he would uncover the elementary principles of sensitivity and nerve function.

Years have gone by. Molecular biologists have been instrumental in laying bare the extraordinary complexity of nerve cells and the brain. It is believed that a large part of the human genome (70–80 per cent) is made up of genes specifically expressed in the nervous system. The small molecules, which transmit signals between cells and the membrane receptors they bind to, have been characterized. Some of the enzymes involved in stabilizing these signal transduction paths, and therefore in memory, have also been characterized. Using the technique of homologous recombination (once a gene has been identified and characterized, it is replaced by a non-functional copy), neurobiologists have been able to show that the genetic coding for these receptors or enzymes is clearly also involved in the workings of the brain and memory. However, there is no guarantee that the greatest advances in neurobiology will come from these molecular studies, for they uncover the nature of the materials used to build the central nervous system, but do not explain the functional organization. Nor is research into artificial intelligence or the work (of variable quality) covered by the term 'cognitive sciences' likely to advance studies on the brain; while they are important for progress in information technology and systems, only rarely do they give consideration to existing knowledge about the structure of the central nervous system. In most cases, the key objective is not to describe what happens in the brain, but to provide new tools for developing 'smart' machines achieving ever-greater performance levels. New technologies, however (magnetic resonance imaging, MRI, and positron emission tomography, PET) have made it possible to 'see' the brain at work and thus describe the structures involved in each type of behaviour. For a number of years now, these

have been revolutionizing our knowledge of the central nervous system. They have provided convincing arguments that support the existence of mental images as postulated by psychologists for so many years. Progress over years to come in our knowledge of the human brain may not be, therefore, at the most fundamental level. It could be that the development and expansion of these studies may well signal the end of the golden age of molecular biology.

## FUNDAMENTAL CHANGES IN THE NATURAL SCIENCES AND MATHEMATICS

At the second International Congress of Mathematicians held in Paris in 1900, the German mathematician David Hilbert gave a remarkable lecture presenting twenty-three problems, which he believed could keep research occupied for years to come. His goal was to show just how vital the mathematics of his time was and to note that advances in mathematics result from research into problems.

Hilbert's first six problems concerned fundamental questions on set theory, arithmetic, geometry and probability: (1) the continuum problem, posed by Georg Cantor, on possible cardinal numbers for the infinite subsets of the straight line, (2) the consistency of arithmetic axiomatized by Giuseppe Peano, (3) the need for infinitesimal methods to calculate the volume of a pyramid, (4) the classification of geometries where a straight line is defined as the shortest path between two points, (5) analysis of transformation groups with continuity being the only assumption, and (6) the axiomatization of calculations of probability and mechanics.

The next six problems concerned the theory of numbers: (7) transcendence of numbers in the form $\alpha\beta$ where $\alpha$ and $\beta$ are algebraic, $\alpha \neq 0, 1$ and $\beta$ is irrational, (8) Riemann's hypothesis on zeros in the function $\zeta(s)$ and the distribution of prime numbers, (9) general reciprocity laws for $\ell$-th power *modulo* residues an ideal prime of a number field, (10) a decision algorithm for the existence of integral solutions to Diophantine equations, (11) the theory of quadratic forms with any number of variables and with coefficients in a number field, and (12) construction of Abelian extensions of a number field using special function values.

The next two problems were algebraic: (13) is it possible to solve the general equation of the 7th degree by formulae using functions of only two variables? (14) the existence of a finite number of generators for certain sub-rings of a field of rational functions. Then problems number 15 (a rigorous foundation for Schubert's enumerative geometry) and number 16 (the number and arrangement of the connected components of a real plane algebraic curve, the number of limit cycles for a differential equation) concern algebraic geometry, while problem 17 (can any positive definite form be expressed as the sum of squares?) is another algebra problem. Problem 18 concerns Euclidean geometry of a higher dimension; basically it involves classification of crystallographic groups.

The last five problems deal with the theory of functions and differential equations: (19) the analysability of solutions to regular variational problems, (20) the existence of a solution for boundary value problems arising from regular variational problems, (21) the existence of a Fuchs type linear differential equation with given singularities and a given monodromic group, (22) the uniformization of analytical relations by means of automorphic functions, and (23) the development of methods in the calculus of variations.

While some of these problems, for example the third and fourth, were solved quite quickly, others have kept research going for many years and have led to new theories which, in turn, have left their mark on twentieth-century mathematics. Hilbert's problems 8 and 12 remain beyond our reach.

Problems 1, 2 and 10 have been the subject of research in *mathematical logic*. The discipline emerged from a programme on proof theory formulated by Hilbert in the 1920s in an attempt to solve problem 2. The programme institutes a formal method where the mathematical theories studied are codified using a set of symbols assembled according to explicit rules of syntax to write up the propositions and proof of the theory; the meaning of the statements is set aside to focus study solely on the groups of signs, using rigorously finite reasoning. In 1931, the Austrian logician Kurt Gödel succeeded in demonstrating the impossibility of proving the consistency of a formalized theory containing Peano arithmetic without using more powerful resources than those found in the theory being considered; such a theory by definition contains undecidable statements, i.e. while they cannot be proved, they cannot be disproved either. In 1938 Gödel proved that while the axiomatized set theory is consistent, it can be associated with the continuum hypothesis (whereby one infinite part non-countable on the right has the power of the continuum) without introducing inconsistency. It was not until 1963 that the American mathematician Paul Cohen showed it is possible to associate the negation of the continuum hypothesis without introducing inconsistency; and therefore the continuum hypothesis is undecidable in set theory. These proofs of *relative* consistency are based on the concept of a *model* for formal theory, and theoretical work on this had started in the 1930s with research by the Polish logician, Alfred Tarski. The symbols and propositions in a formal theory were assigned to subjects and statements of a theory believed to be known (e.g. set theory), in such a way that the axioms of the formal theory correspond to the true statements in the model; a formal theory that accepts a model will not be inconsistent if the theory used to provide the model is not inconsistent.

In 1970, the tenth problem was solved by Yuri Matiyasevich; the solution is negative, i.e. the algorithm in Hilbert's question does not exist. Work by logicians in the 1930s had helped specify what had to be understood by algorithm and computable function; reference can be made to the notion of recursive function devised by Gödel and the Turing machine concept of the English logician Alan Turing. According to Gödel, there are sets of natural numbers that are recursively enumerable (sets of recursive function values) but not decidable, i.e. there is no algorithm for deciding whether a number belongs to it or not. It is also noted that a set of natural numbers is Diophantine when it is the projection of the set of the solutions to a Diophantine equation, i.e. a polynomial equation with integral numerical coefficients where the unknown quantities must be whole numbers. In 1952, the American logician Julia Robinson established that, to prove that any recursively enumerable

set is Diophantine, a Diophantine predicate of 'exponential growth' was all that had to be constructed; a Diophantine predicate expresses belonging to a Diophantine set. This is exactly the construction devised by Matiyasevich: he proved that the property '$n$ is the $2m$-th Fibonacci number' is an exponential Diophantine predicate.

The axiomatization of probability calculus was the subject of a great deal of research in the first thirty years of the twentieth century. In 1933, the Russian mathematician Andrei Kolmogorov published a monograph detailing the fundamental axioms for calculating probability; it links up with the theory of measurement and integration developed earlier in the century by Émile Borel and Henri Lebesgue. The basic concepts are *event*, *probability* and *random variable*. The events are certain parts of a set $\Omega$; these parts form a *sigma-field*, i.e. that the complement of an event is an event and that the union of a series of events is an event. The probability of each event $A$ is assigned a number $p(A)$ between 0 and 1; the probability $p(\Omega)$ of the *certain* event $\Omega$ is equal to 1 and, where $(A_n)$ is a series of two-by-two disjointed events, the probability of them being reunited is equal to the sum of the $p(A_n)$. This definition needs to be completed by including the definition of conditional probability: let $B$ be an event with non-zero probability, then the probability $p(A|B)$ of $A$, given that $B$ is occurring, is defined as the quotient

$$\frac{p(A \cap B)}{p(B)};$$

where it is equal to $p(A)$, i.e. where $p(A \cap B) = p(A).p(B)$, events $A$ and $B$ are said to be independent. A random numerical variable is a function $X$ over $\Omega$ with real values and so that, for any interval $I$ in real numbers, the set $\{\omega \mid X(\omega) \in I\}$ of elements $\omega$ of $\Omega$ where the range $X$ belongs to $I$ is an event. The law of probability of $X$ is the measurement which assigns $p(\{\omega \mid X(\omega) \in I\})$ to the interval $I$; the expected value of $X$ is defined as the integral of $X$ with respect to probability $p$ or the integral of the function $x$ with respect to the law of $X$. A theory of *stochastic processes* was successfully developed, similar to Brownian motion. Such a process is defined by the datum of a family $(X_t)_T$ of random variables; interpreting the index $t$ as a time, $X$ is the random result of a physical measurement at the point of time $t$. In the 1950s, the American mathematicians Joseph Doob and G. Hunt interpreted potential theory in terms of stochastic processes. Subsequently, numerous applications for calculating probabilities in analysis and differential geometry were developed. One example is ergodic theory, which emerged from Boltzmann's ideas on statistical mechanics and involves the study of dynamical systems from the point of view of measurement. Probabilities are also present in many applications in the world of physics, through mathematical statistics.

The solution to Hilbert's fifth problem comes from the theory of topological groups, such a group being a topological space with a law of continuous internal composition, which makes a group where the inverse of an element depends constantly on that element. A Lie group is an analytical variety with a law of analytical composition, which makes it a group. The theory of topological groups was devised in the twentieth century, starting in the 1930s; over the same years, Elie Cartan and Hermann Weyl tackled the global theory of Lie groups (Lie theory being a purely local theory). In 1935, the positive solution to Hilbert's problem was found by John von Neumann and Lev Pontryagin for a finite-

dimensional compact group or a locally compact commutative group, using the linear representation theory of groups. The key tool is the Haar measure which is invariant for translations (e.g. right translations) on the group; the existence of such a measure, which is virtually self-evident in the case of Lie groups, was proven by A. Haar in 1933. A complete family of finite-dimensional irreducible linear representations in a given compact group can then be constructed; the spaces of these representations are formed by the intrinsic functions of certain integral operators on the group. As a result, any neighbourhood of the neutral element in the group contains a sub-group distinguished so that the corresponding quotient is a Lie group; in particular, a connected finite-dimensional locally compact group is a Lie group. Irreducible representations of a locally compact commutative G group are all of dimension 1; these are continuous G homomorphisms in the multiplicative group U of complex numbers with the absolute value 1, known as G *characters*. The G* set of characters of G has a natural group structure, arising from the structure of U, and a topology which makes it a locally compact group referred to as the *dual* group of G; the G group naturally identifies with the dual group of G*. The dual of a compact group is discrete; for example, the dual of U identifies with the additive group Z of integers, its characters being in the form $\chi_n(e^{i\theta}) = e^{in\theta}$ ($n \in$ Z), but the dual of the additive group R of real numbers identifies with R, the characters being in the form $\chi\lambda(x) = e^{i\lambda x}$. This theory meant Pontryagin was able to prove that a locally compact commutative group generated by a compact neighbourhood of its neutral element is a finite product of groups of one of the types U, R, Z, Z/$n$Z. It should be noted that Pontryagin duality provides the natural framework for commutative harmonic analysis, covering the study of the Fourier transformation between the functions over G and the functions over G*.

The general case required other methods, for there are locally compact topological groups without any complete system of linear representations; this was done in 1952 by A. Gleason, Deane Montgomery and Leo Zippin, who proved that a locally compact group that operates in an effective and transitive way on a finite-dimensional locally connected and locally compact space X is a Lie group and that X is a homogenous space in it (and therefore an analytical variety). The central finding is that a locally compact group G where there is a neighbourhood of the neutral element $e$ not containing any sub-group other than $\{e\}$ is a Lie group. The tangent space $e$ is formed for this group using sub-groups with one of the G parameters, i.e. continuous homomorphisms of R in G; if $x$ and $y$ are two such one parameter sub-groups, their sum is defined as the limit, for infinite $m$, of

$$\left( x\left(\frac{t}{m}\right) y\left(\frac{t}{m}\right) \right)^m \quad (t \, \hat{I} \, R).$$

An 'associated' representation of G can then be defined in this tangent space and the kernel of this representation is essentially commutative.

The linear representation theory of Lie groups was a subject for a great deal of research, in particular because of its role in quantum mechanics (representation of the Lorentz group). In 1939, the physicist E. Wigner discovered that irreducible unitary representations could be infinite-dimensional. To this day little is known about the more

general case and the theory has only been properly developed for real reductive groups (Harish Chandra) and for nilpotent groups (A. Kirillov). Coefficients of linear representations are special functions and this theory has been greatly elucidated by the theory of groups.

Algebraic numbers are complex numbers that satisfy an algebraic equation of whole coefficients; the others are called transcendental numbers. Joseph Liouville proved the existence of transcendental numbers in the nineteenth century; excluding Liouville's numbers (which are somewhat artificial), the only transcendental numbers known prior to 1900 were $e$ (Charles Hermite, 1873) and $\pi$ (F. Lindemann, 1882). General methods for proving that certain numbers were transcendental were developed in the twentieth century and helped solve Hilbert's seventh problem in 1934 (Aleksandr Gelfond and Theodor Schneider). These methods related to the properties of certain transcendental functions; it was shown that their values are transcendental numbers when the variable has an algebraic value. They are also based on the approximation properties of irrational numbers using rational numbers ('Diophantine approximations'); the idea is that if the number is considered as algebraic, the approximation cannot be very fast. After the theorems devised by Axel Thue (1909) and Carl Ludwig Siegel (1921, 1929), the best finding of this kind was by K. Roth (1955), stating that where $a$ is algebraic and $\varepsilon > 0$, there can only be a finite number of couples $(p,q)$ of whole prime numbers between them, so that

$$\left| \alpha - \frac{p}{q} \right| \leq q^{-2-\varepsilon}.$$

Such findings have applications for Diophantine equations; Siegel was thus able to prove that an equation $f(x,y) = 0$ of the kind $\geq 1$ can have only a finite number of solutions in whole numbers. Interest in transcendental numbers was revived after Alan Baker (1966) succeeded in lowering the bounds of linear combinations with algebraic coefficients of logarithms of algebraic numbers.

Riemann's hypothesis, which is Hilbert's eighth problem, states that the *zeta* function, defined for

$$\mathrm{Re}\, s > 1 \text{ as } z\,(s) = \sum_{n \geq 1} \frac{1}{n^s},$$

does not vanish for $\mathrm{Re}\, s > 0$, when on the 'critical' right $\mathrm{Im}\, s =$ ; if this property is true, it can be used to show, as Riemann had observed, the order of magnitude of the difference between the function of distribution of prime numbers and the integral logarithm function equivalent to it. In 1942, the Norwegian mathematician Atle Selberg showed that, whenever $T > 0$, the proportion of zeros $s$ of $\zeta$ so that $|\mathrm{Im}\, s| \leq T$ which are on the critical right remains higher at a certain number slightly smaller than 1; if Riemann's hypothesis is true, this proportion must be equal to 1. It is also known that for any zero $s = \sigma + it$ with $t > 0$, $\sigma \leq 1 - A(\log t)^{-2/3}$ when $A$ is a positive constant (I. M. Vinogradov and N. M. Korobov, 1958). Computer calculations, which can be used to reach a very large number of zeros of $\zeta$, still confirm Riemann's hypothesis, but no path has been found for attacking the proof and the Clay Foundation has acclaimed it as one of the seven great mathematical problems for the twenty-first century.

However, proof has been given of the analogy with Riemann's hypothesis for zeta functions attached to algebraic varieties over finite fields. The situation is then simpler as these functions are rational in relation to the variable $q^{-s}$, where $q$ is the number of elements in the base field. These functions are found in evaluating the number of polynomial congruence solutions; the first were submitted by Emil Artin (1924) for congruences expressed as $y^2 \equiv P(x)$ (mod.$p$) ($P$ being a polynomial of whole coefficients, $p$ a prime number), defining a hyperelliptic curve over the field with $p$ elements. In 1935, Helmut Hasse proved Riemann's hypothesis for the $\zeta$ function of type 1 curves (elliptic curves) over a finite field, then André Weil (1940, 1948) proved it for any curve. To do so, he had to devise abstract algebraic geometry (1946), where the coordinates could be in any commutative field and no longer in the field of complex numbers. In 1949, Weil developed his famous conjectures on the zeta function of an any-dimensional algebraic variety over a finite field (rationality, functional equation, Riemann's hypothesis). These conjectures, interpreted in terms of cohomology of algebraic varieties, boosted algebraic geometry, in particular from 1957 on, with Alexandre Grothendieck, who successfully developed the cohomological theory that was to lead on to the proof of Weil's conjectures by Pierre Deligne in 1973.

According to the law of quadratic reciprocity, if $p$ and $q$ are odd prime numbers which are not both in the form $4n+3$, the properties '$p$ is congruent to a square mod.$q$' and '$q$ is congruent to a square mod.$p$' are equivalent; where $p$ and $q$ are in the form $4n+3$, if one of the two properties is true, the other is false. In the nineteenth century, analogous laws for residues of the powers of 4 and 3 (Jacobi, Eisenstein) then $\ell$ odd prime (Kummer) were found. In his ninth problem, Hilbert calls for a more general law, where the field of rational numbers is replaced by a field of algebraic numbers, prime numbers being replaced by ideal primes. This law was proven by T. Takagi (1920), Hasse (1926, 1930) and Artin (1928) as part *class field* theory, studying the structure of finite Abelian extensions of a given number field $k$ and the decomposition of ideal primes in $k$ in such an extension. Hilbert himself had transposed the law of quadratic reciprocity using 'local' symbols

$$\left( \frac{a,b}{p} \right),$$

equal to 1 or $-1$ depending on whether the congruences $x^2 - ay^2 \equiv b$ (mod.$p^k$) have or do not have a solution for any $k$; a symbol has to be added

$$\left( \frac{a,b}{\infty} \right)$$

equal to 1 unless $a$ and $b$ are negative, in which case it is equal to $-1$. The reciprocity law is then expressed by stating that the product of

$$\left( \frac{a,b}{p} \right)$$

for all prime numbers $p$ and for the 'point at infinity' $p = \infty$ is equal to 1. Generalization consists of defining symbols

$$\left( \frac{a,b}{\mathrm{P}} \right)_\ell$$

for all the 'points' p of a number field $k$; these points are the embeddings of $k$ as a sub-field in a non-discrete complete valued field: there is an infinite number of these assigned to the ideal primes of $k$ and a finite number of them which

embed $k$ into R or C. Unfortunately there is no complete knowledge explaining these local symbols.

The eleventh problem again makes use of these local methods, for the theory of quadratic forms over a number field $k$ is based on the Hasse-Minkowski principle which states that, for a form $f$ to be transformed into a form $g$ with variables introduced by linear substitution (representing $g$ by $f$), it is enough for it to be on each local completion $k_p$ of $k$. But, for forms with whole coefficients, local conditions are not sufficient for concluding that the transformation can be done from $f$ to $g$ by linear substitution with whole coefficients. Two forms, $f$ and $f'$, are said to belong to the same type if, at every point $p$, it is possible to go from one to the other by invertible linear substitution with coefficients in the ring of whole numbers of $k_p$; each type contains a finite number of classes of forms equivalent on the ring of whole numbers of $k$. Siegel (1935, 1937) showed how to calculate the average of the number of representations of a form $g$ by the forms of the type to which $f$ belongs as a product of relative local factors at different points. Subsequently, T. Tamagawa and M. Kneser (1961) interpreted these formulae using the adele ring of the orthogonal group G. This is the sub-group $G_A$ of the product

$$\prod_p G(k_p)$$

formed by the elements for which all the components, except for a finite number of them, are whole; this sub-group has a topology which makes it a locally compact group into which $G(k)$ is embedded as a discrete sub-group. The quotient $G_A/G(k)$ is finite in volume for an invariant measure, and Siegel's formula is equivalent to the calculation of this volume.

In the mid-nineteenth century, Leopold Kronecker realized that any Abelian extension of the field Q of rational numbers is contained in an extension generated by the roots of the unit of the form $e^{2\pi i/n}$. He had conjectured an analogous expression for the Abelian extensions of an imaginary quadratic field $k$, these being contained within extensions generated by values of elliptic functions with complex multiplication in $k$ and by the corresponding values of the modular invariant. This conjecture was proven by Takagi (1920). Hilbert's twelfth problem was to find functions able to give a similar description of Abelian extensions for any number field. Certain extensions of an imaginary quadratic field over a totally real number field can be described using complex multiplication of Abelian varieties, these being analogs, on a higher dimension, of elliptic curves (Goro Shimura and Yutaka Taniyama), but there is no hope of finding all Abelian extensions this way. A more interesting path seems to be in the programme devised by R. Langlands in 1967. This was a generalization of the work by E. Hecke showing a correspondence between automorphic forms (one variable) and the Dirichlet series. Langlands defined generalized automorphic forms associated with a reductive linear algebraic group G defined over a number field $k$ considering the space $E$ of square integrable functions on the quotient of $G_A$ by $G(k)$. A parallel theory exists where $k$ is an algebraic function field in one variable over a finite field. The subject is the natural representation of G in the subspace $E_0$ of 'parabolic forms', and each irreducible representation $\rho$ of G occurring in this representation is associated with a function L($\rho$,$s$), an infinite product of local factors associated with points in $k$;

Langlands conjectured that this could be used to calculate all the Dirichlet series occurring in number theory and algebraic geometry. Where G is the multiplicative group $GL_1$, Langlands' conjecture is equivalent to Artin's law of reciprocity. The general case was recently proved by Laurent Lafforgue for the case of a function field. For a number field, we are still a long way from having complete results, which would extend the theory of class fields to non-Abelian cases. The proof of Fermat's last theorem by Andrew Wiles (1994) consists of proving a Taniyama-Weil conjecture on elliptic curves as a consequence of Langlands' conjecture.

In a sample of some ten cases, it has been seen that the solving of Hilbert's problems inspired research throughout the twentieth century. But some theories developed independently of these problems, for example algebraic topology, the theory of partial derivative equations, the theory of dynamical systems and differential geometry. In these, as in previous cases, the mid-1930s can be seen as a turning point; this was a time when difficulties had built up, forcing mathematicians to devise new theoretical tools for general application, reviving work on the very foundations of a number of sectors.

This was the case for logic, with the theory of models and the specific notion of computability, and for probability with Kolmogorov's axiomatics and the theory of stochastic processes. The theory of linear representations of groups and the theory of partial derivative equations led to the development of *functional analysis*, where objects are infinite-dimensional spaces of functions, which may conceivably be generalized. In particular, the study of hyperbolic equations imposed the idea of generalized solutions, no longer seen necessarily as functions (Sergei Sobolev, 1936, Laurent Schwartz 1951); this was how the theory of *distributions* was developed. Algebraic topology, which endeavours to classify topological spaces using invariants that are algebraic in nature, was one of the dominant theories in the twentieth century; it became increasingly algebraic in the 1930s and developed to the point of devising auxiliary techniques such as homological algebra (a type of extension of linear algebra), the theory of categories (Samuel Eilenberg and S. MacLane, 1942) and sheaf theory (Jean Leray, 1945–46). Sheaf theory provided the basis for the revival of algebraic geometry led by Jean-Pierre Serre (1955) and Grothendieck. Algebraic geometry and number theory also stimulated the development of commutative algebra.

This period of renewed interest ended by the mid-1960s, by which time a certain number of problems previously beyond reach could be successfully tackled. The years from 1935 to 1965 were marked by the activity of N. Bourbaki (a collective name for a group of French mathematicians) working on the most fundamental aspects of mathematics in a unified approach, based on Hilbert's axiomatic method and the concept of mathematical structure. The period was also a time when mathematics and physics moved apart, in contrast with the 1920s when physicists and mathematicians joined forces, working closely together on general relativity and quantum mechanics. The theory of general relativity revived interest in research into differential geometry, while quantum mechanics provided an opportunity for developing the theory of the algebra of operators on a Hilbert space; in fact, mathematicians such as Weyl and Von Neumann did the work of physicists. The symbiosis between physics and mathematics returned in the 1970s and 1980s with the development of the quantum theory of fields, gauge theories,

supersymmetry, non-commutative geometry and quantum groups. One example can be seen with the 1990 Fields medal, awarded to the American physicist Edgar Witten.

Outside of fundamental physics, mathematics can also be found in such applications as celestial mechanics, elasticity, hydrodynamics, medical imaging, oil exploration, cryptography, telephone transmission and information technology. But groups of mathematicians focusing on these applications often see themselves as apart from other mathematicians, thus creating a sociological divide between 'pure mathematics' and 'applied mathematics', which is not based on any fundamental difference in methods. Perhaps the reasons behind this divide should be looked for in the vast expansion of new applications over the war years.

## NEW SUBJECTS AND METHODS IN PHYSICS

Many of the major technical achievements and changes to our knowledge of physics have not been mentioned in previous chapters, even though they have helped transform our everyday lives. Take, for example, plasma physics, or our hopes of finding a way of controlling and using thermonuclear fusion, or developments in statistical mechanics and thermodynamics, relevant not only to phase transitions and critical phenomena, but also to phenomena far from equilibrium. There are numerous applications in chemistry, with illustrations provided by the work of Ilya Prigogine and his school. Another enriching field of study is found in 'everyday' physics, where problems that seem as ordinary as the equilibrium of a pile of sand or the contact between a drop of boiling liquid and a hotplate require ingenious and erudite theoretical explanations. In the field of chemistry, mention should be made of the complex architecture of molecules which, to cite one example, Jean-Marie Lehn shaped to fit multiple applications. And there are many other illustrations of how physics has contributed to our understanding of everyday events.

In the following section we will simply point out some of the problems raised by the new ideas arising from physics: first there is the basically philosophical question of the relationship between physics and mathematical abstractions, which extends to the issue of the dialectics of simplicity and complexity; then there are the changes in the conception of the nature of physical theory arising from the theory of dynamical systems, commonly referred to as the theory of deterministic chaos; and lastly there are various aspects concerning experimental techniques and developments that have occurred in what is now called 'big science'.

### Abstract subjects, mathematically formalized theories, simplicity and complexity

Physics underwent major theoretical changes in the course of the twentieth century, affecting both the definition of the subject of study and the nature of the founding theories and experimental procedures.

From a conceptual and theoretical point of view, physics went through both the relativistic and quantum revolutions, forcing it to rebuild, or rather acquire a different understanding of the concepts of time, space and energy, of the material particle and even of the idea of quantity or magnitude and of a physical system in general. These concepts and quantities were then beyond the grasp of previous 'intuitive' or absolute representations, and their form (expressed in mathematical terms) and content were constituted as functions of phenomena expressed in physical principles governing their relations. These principles are often presented as conditions of invariance applying to the transformations of these quantities, being characteristic of the dynamic laws governing a given domain.

These conceptual and theoretical changes simultaneously transformed our general views on physics, on the definition of its subject area and the development of its theories. One of the most striking features of current conceptions is the increasingly close relationship between physical theories and mathematical formalisms. This interweaving simply highlights a feature in the logical path of previous developments where theoretical physics was built through analysis, with differential and integral calculus for the mechanics of material points and solid state mechanics, and was then extended to partial derivative equations for fluid mechanics and field theory.[80]

With general relativity and quantum theory, *mathematical formalization* became a particularly powerful tool for theoretical work in physics, making it possible to express known or recognized physical properties, both general properties or *physical principles* and quantitative relationships between quantities. The principles (spatio-temporal or internal invariances) had been laid down, and the quantities or magnitudes used to describe the physical systems (e.g. atomic or nuclear states, particles or fields) were already known or had been formulated, so the theory connecting these quantities and guided by the principles was almost entirely deductive.

Theoretical representations of the (quantum) structure of matter have taken this feature to quite an extreme degree. They involve physical magnitudes derived from abstract formulation, devised on the basis of properties of invariance; this is the case, for example, of quantum numbers such as spin, fermion charges or baryonic and leptonic numbers, and the flavours and colours of quarks. The relationships between these quantities determine the more general symmetry properties, which are then raised to the rank of principles and adopted to govern the form of the dynamic theory. This was how gauge invariant theories were formulated for fundamental matter, electroweak and chromodynamic fields. The idea of *invariance* or *symmetry* required these to also be unified at the same time, as developments leading to these theories have shown with great eloquence. So it is that a large part of fundamental physics, the most mathematically formulated part, seems to be moving towards a unified theory.

Underlying this observation is a new version of the idea that mathematics can be used as the most accurate means of expressing the hidden, deep-seated structural link between elements that are part of the same reality. This is no doubt the basic reason for the preferred relationship (although it is actually a relationship in constitution) between physical thought and mathematical thought.

It should be noted, however, that this trend in theoretical physics towards more abstract and mathematical expression has not, despite its fundamental nature, exhausted the representations of matter in its different structural levels. The complexity of these levels, even when reduced in principle to elementary simplicity, does not vanish, but

requires intermediate theoretical concepts and models. Knowledge of the basic constitution of matter (fields and particles), while reconstructing combinations of elements, cannot produce a representation for direct use depicting the complex levels of organization (e.g. nuclear matter inside atomic nuclei, atoms and chemical properties, large sets of molecules and macromolecules, or macroscopic behaviour of matter). Specific theories or models, which can be appropriately handled and are relatively simple, are needed for each level, where the relevant physical quantities are only connected in an increasingly remote way to the quantities at the most 'fundamental' level. This observation applies for both conceptual and practical reasons.

The connection between the representations of the different levels is the task for research in the diverse branches of physics, chemistry and other disciplines. But the epistemological questions it raises are related to the general issue of reducing something to its elementary level and of constituting 'complex' levels, or 'emerging' levels. When moving from the level seen as fundamental to a structural or organizational level of greater complexity, consideration must be given to properties which appear only at this level and are expressed by specific 'emerging' quantities (e.g. the concept of valence in chemistry). Here it is more a case of tension developing between two approaches, each with a different orientation, yet each one essential, rather than a case of inherent duality. New interdisciplinary approaches are needed to explore the dynamics of knowledge in these bordering regions.

## Dynamic systems and deterministic chaos

Since the 1970s, the study of dynamic systems, previously relegated to a relatively minor branch of mathematics, has developed into a discipline that now stands as one of the most important, not only in mathematical physics but also in theoretical and experimental physics. The central idea goes back to the mathematical research of Henri Poincaré in dynamics, working on the qualitative theory of differential equations that developed from his study of the three-body problem in astronomy (1889). One of the solutions to these totally deterministic equations was so complicated and unusual for a certain configuration that it seemed to be random. Yet it was possible, without writing out exact solutions, to describe the nature of the solutions, i.e. their structural behaviour, with stable or unstable equilibrium. Poincaré then introduced the 'limit cycle' concept.

Considering therefore that the fundamental problem for dynamics was to find quasi-periodic solutions of systems and to discover how they behaved, Poincaré devised, to quote the Swedish Academy, 'a new way of thinking'. He had shown for the first time that, in perfectly determined events, 'a very small cause, which escapes us, determines a considerable effect'. At a certain point in time, a tiny element of uncertainty on the initial conditions makes it impossible to produce any accurate prediction.

Around 1892, Alexander M. Lyapunov had been conducting work with a similar focus on the stability of motion. Between 1930 and 1960, a school of applied mathematics and mathematical physics developed in the Soviet Union. Its focus was non-linear dynamic systems and stochastic processes. Problems in the regulation of

machines and radio techniques (with electromagnetic waves) focused interest on non-linear oscillations, working on systems of conservation and their qualitative behaviour, and also on dissipative systems.

A. A. Andronov, one of the pioneers of the Russian school of mathematics in dynamic systems, studied the findings of Poincaré and Lyapunov and applied them to physical situations in the domain of dissipative physical systems, developing a general theory of non-linear oscillations based on the idea of a self-oscillating system and bifurcations. His first paper on 'Poincaré's limit cycles and self-sustained oscillations' was published in 1929 by the Académie des Sciences in Paris. Applications were relevant to many fields, including acoustics, radiophysics, reaction chemistry and even biology. In 1937, with his fellow authors A. A. Vitt and S. E. Khaïkin, he published his landmark work, *Theory of Vibration*.

Other prominent members of this school were L. I. Mandelstam, N. S. Krylov and N. N. Bogoliubov, who developed non-linear physics, and the great mathematician Andrei N. Kolmogorov, who was also known for his outstanding work on the theory and applications of probability. In 1940, he had also tackled turbulence phenomena and later, in 1950, dynamic systems.

In the United States, George David Birkhoff, author of *Dynamical Systems* (1927), and his student G. M. Morse, worked on the development of 'topological dynamics', while Salomon Lifschitz explored the findings of the pioneers in the Russian school and, in the late 1940s, pursued his study of differential equations in dynamics.

In the course of the 1960s, work by Stephen Smale and Valentin I. Arnold investigating differentiable dynamical systems drew attention to the findings of the Soviet school and marked the beginning of international interest in these problems. In 1963, the meteorologist Edward Lorenz used a computer to calculate predictions with a simplified mathematical model of convection currents in the atmosphere and found the same considerable effect amplifying small differences in the initial condition that had been noted by Poincaré: small causes, such as localized storms or the flutter of a butterfly's wings, can produce substantial effects on weather on the scale of the hemisphere, or of the entire planet. The sensitivity of such totally deterministic systems to tiny changes in the initial conditions meant it was impossible to predict their ultimate behaviour: the term 'chaos' was suggested soon after to describe this situation, which is in fact extremely frequent. In the 1970s, Lorenz applied his ideas to the biology of populations and it was subsequently noted that chaotic behaviour patterns were to be found in the most diverse areas, e.g. the behaviour of the solar system, the operation of lasers, the evolution of ecosystems and the kinetics of chemical reactions.

In 1971, David Ruelle and Floris Takens showed that chaotic behaviour is not intrinsically linked to a large number of parameters, and introduced the concept of the 'strange attractor' to describe the characteristic curve of the parameter of a chaotic system that is actually the final stages possible in dissipative systems. This concept was then moved to the centre of the theory as a substitute for the parameters: the attractor is the hidden structure concealed by the apparent chaos of the trajectories. In doing so, the local focus becomes global, details give way to generic considerations and to the type of stability of the configurations. Proof could be found for these attractors,

first through digital simulation, then in laboratory conditions with, for example, hydrodynamic phenomena (Pierre Bergé, one of the pioneers in the physics of chaos as studied from the phenomenological viewpoint).

For a dynamic system to be chaotic, it must comply with certain conditions: complex systems with a large number of parameters need to be described using well-established equations (e.g. the future orbit of the Earth), or otherwise to have a small number of parameters (e.g. certain chemical reactions). In biology and economics, it is more difficult to establish whether the systems are genuinely chaotic because of the uncertain nature of their mathematical modelling. Whatever the case may be, chaos can be a powerful theoretical tool for studying new properties and behaviour patterns.

## Experimental methods and techniques in the era of 'big science'

In certain areas of physics, such as nuclear and solid-state physics, a close link was established between the development of scientific research and the development of industry after the Second World War. The Manhattan Project for building the first atomic bomb is a good example.[81] This seems to have been the signal for change in research in these and other disciplines. The change has affected the way researchers work, the methods and techniques used for experimentation, relations with public authorities, and the organization of research, which is now performed by groups and teams working in large laboratories where researchers and engineers collaborate closely, inventing and using original, complex, high-precision instruments.

These are large and costly machines that have been built using the most advanced techniques, such as high vacuums, superconductivity, electronics and computer processing, often developed in research laboratories well before being adopted for industrial use, and providing just as many offshoots for use in other domains. They are increasingly being used by groups built around international partnerships; this is the case of large particle accelerators, major observatories and space laboratories.

Subatomic physics and astrophysics are two typical examples of this form of science that originated in the second half of the twentieth century and which has been dubbed 'big science'. The term refers to science requiring 'big' resources – financial, material, technological and organizational – and which is considerably different from scientific research in the past, which was conducted more on an individual basis. In research nowadays, there is a close link between the development of theoretical ideas and the conducting of experiments related to technical advances it has often helped bring about; this is the case for the technology used in accelerators for nuclear physics[82] and particle physics.[83] These are needed to generate and accelerate intense beams of nuclei and particles or radiation of all kinds,[84] to develop various detectors for precision analysis of reaction products,[85] and for on-line processing of complex data and fine statistics using huge calculators, and for shape recognition and high-definition tracking. These analytical techniques originally devised for particle physics have also been adapted for collecting data in the field of astrophysics.

Interaction between leading-edge technology and experimental research is also common practice in domains other than those cited above: e.g. in very low-temperature technology and the cooling of atoms, for Bose-Einstein condensation, plus in overcoming the challenges in the planned use of devices for detecting gravity waves. Generally, in order to find proof of phenomena of a new kind deduced from the theoretical advances of physics, it is necessary to make the corresponding experimental and technical advances.

Another noteworthy feature is the 'plasticity' of the applications of modern physics, with equipment developed to gain knowledge of fundamental physical phenomena subsequently being used for research or applications in quite different domains, in physics, biology and medicine. One example is synchrotron radiation, with electron accelerator rings producing beams as intense and finely defined as lasers, covering a broad range from gamma and X-rays to visible light, and used both to study solid-state structure and for applications in biology and medicine. A parallel can be seen with X-rays and radioactivity, which were used almost immediately after they were discovered to observe the inside of the human body and provide medical treatment.

A very long list of the uses and applications could be drawn up, but here only a few examples will be highlighted: NMR spectroscopy in chemistry; dating techniques using radioactive elements, first with radiocarbon or carbon-14; the cobalt bomb, with induced radioactivity, used to treat cancerous tumours; advances in brain imaging using radioactive elements, and most importantly the positron camera for extremely accurate localization of damaged areas, which has recently led to great steps forward in neurophysiology; and proportional multi-wire chambers with highly accurate localization capacity, with prospects for diverse applications beyond the simple detection of elementary particles, ranging from medicine to fraud detection for customs officers inspecting goods.

Large telescopes must also be cited. Astronomy and astrophysics are now rivalling subatomic physics with the large machines used for fundamental research. In this field, astronomy already had the experience and a long tradition of large, classical science observatories (e.g. Maragha in Iran, dating from the twelfth century, and the larger-scale copy built in Jaipur, India, in the eighteenth century; the Uranienburg observatory in Denmark built by Tycho Brahe in the seventeenth century; observation using telescopes, and the huge mirror telescopes made by William Herschel towards the end of the eighteenth century). In the late twentieth century large land and space telescopes were constructed, with resolution capacity for viewing celestial bodies in remote systems and the very furthest galaxies – those first formed on the bounds of the visible universe at approximately 15 billion light years.

Of the different land telescopes, special mention should be made of the 10-meter double telescope in Hawaii, named Keck. It is positioned on the top of Mauna Kea volcano, where it can observe the sky of the northern hemisphere. In 1997 and 1998 it spotted two very primitive galaxies on the bounds of the Universe, at some 13 billion light years. There is also the European Southern Observatory (ESO) for the southern hemisphere. Located in the Andes in Chile, it offers outstanding visual acuity with an array of four 8.2 metre telescopes, and a Very Large Telescope (VLT) installed in 2001.[86] Of the different satellite-borne instruments, the Hubble Space Telescope will go down in history, and rightly so, for the extraordinary contribution it has made to our knowledge of celestial objects, distant

galaxies and extra-solar planets. Freed from the constraints in the Earth's atmosphere, it was able to explore regions and phenomena inaccessible to land observatories (e.g. phenomena which can only be seen using infrared light[87]). Many other observatories have giant telescopes, either on land or satellite-borne, and will, over the early years of the twenty-first century, continue this observational exploration of the Universe. (Hubble's successor, NGST,[88] will not orbit around the Earth, but around the Sun.)

## BIOLOGY

### Fundamental changes in biology

Biology is seen today as a group of different disciplines, with quite distinct subjects and levels of observation. One approach classifies these disciplines according to the scale used to study phenomena in living organisms.

An initial group is composed of molecular genetics, biochemistry and cell biology. These three disciplines analyse the complexity of living organisms at the macromolecular level. Each one has its specificity: genetics studies genes and their mechanisms of action; biochemistry focuses on a structural study of DNA and more importantly of proteins, the second essential constituent of living organisms; while cell biology investigates intra-cellular organization and movements of macromolecules within that structure. The term 'molecular biology' is often used to refer to part or all of the experiments conducted in these three disciplines (as well as other biological disciplines, as mentioned below) and which do not fit into any established discipline, but are related to a certain view of living phenomena and the desire to explain all the properties and functioning of living beings by studying their macromolecules.

The second group of disciplines studies the organism as a whole, either describing its properties and classifying it on the scale of living organisms (zoology and botany), or describing the way it functions (physiology). Physiology also encompasses a number of specialized fields dealing with one or another of the major functions of living organisms (e.g. endocrinology, immunology and neurophysiology). There are obvious links between physiology and medicine, and the same applies to other disciplines dealing with micro-organisms, many of which are pathogens affecting humans (bacteriology, virology and parasitology).

The third group of biological disciplines includes areas covering all living beings, to study either their social behaviour (ethology), their complex interactions with the environment (ecology), or the evolution of their genetic make-up (population genetics).

This discipline-based presentation does not reflect the major changes that each of these disciplines has experienced over the past century, nor the successive waves of unification which have recognized the special significance of biology in the early twenty-first century (see the above section on Molecular Biology for the description of these changes).

### A far-reaching development in biological disciplines

In 1914, with Thomas H. Morgan's first studies of *Drosophila*, genetics discovered the organism that would not only establish the discipline, but also produce findings

confirming the link between genes and chromosomes, making it possible to draw up the first genetic maps. But almost twenty years more were needed for these genetic maps to merge with the physical maps of chromosomes. The slow process of objectification – of 'reification' of genes – was only fully achieved when the genes were identified with the DNA molecule, whose structure (the double helix) was discovered in 1953 by J. D. Watson and F. Crick. This was the beginning of molecular genetics, which in the following years detailed the mechanisms of genetic action. By the end of the twentieth century, genetics had become a powerful science. Thanks in particular to the techniques of genetic engineering, it had all the tools needed to move from the genetic trait to the gene, to the DNA molecule, and then back to the traits, and to modify them. Genetics is an important science with an increasing number of medical applications, but it is also a science that triggers anxiety in the face of apparent threats to individual freedom. Can the predictive medicine of tomorrow both define our genetic limits and predict our future?

Since 1914, biochemistry has also seen far-reaching changes. The only molecules of living organisms available to biologists in 1914 were small metabolism molecules. Proteins were still poorly characterized and their structure was unknown. The development of such technologies as X-ray diffraction and nuclear magnetic resonance has permitted biochemistry to determine, with great accuracy, the structure of essential biological macromolecules, proteins and nucleic acids. Cell biology reached its peak by the 1950s with electronic microscopes, which gradually revealed the complexity of living cells. This advance was only achieved through close cooperation with biochemistry and later, from the 1970s on, with molecular biology. Today, cell biology is one of the most active disciplines as biologists increasingly integrate the cell level into all molecular observations of living organisms.

Other disciplines have also changed, first with the biochemical revolution, then with the molecular revolution. One example is endocrinology, which examines the mechanisms by which hormones act; the mechanism can only by grasped by determining the structure of hormones themselves, and characterizing the receptors they bind to and the paths that transmit the information from the receptor to the cell nucleus. In most cases any fluctuation in the amount of hormone causes a change in the activity of the genes; this activity can only be understood using the tools and knowledge provided by molecular genetics.

All branches of physiology have also been 'molecularized' to varying degrees, e.g. immunology and neurophysiology. Nevertheless, physiology has retained both its specific level for describing living phenomena and its own techniques, such as medical imaging. Both have contributed greatly to advances in our understanding of the brain. Bacteriology and virology have been as molecularized as physiology (or perhaps even more so). The molecule is the level targeted to characterize the interaction between the pathogenic organism and the host; by using molecular tools, we gain an understanding of the nature of pathogenic micro-organisms.

Those sciences – like zoology and botany – that describe and classify organisms, have also changed considerably. In the 1960s, their fate seemed threatened by the 'modern biology' boom that included genetics, biochemistry and molecular biology. Yet it gradually became apparent that no

study, not even molecular studies, could disregard the findings of these other disciplines, and they too have gained from the contributions of biochemistry and molecular biology. Ever since Darwin, the description and classification of living beings has been based on the establishment of polygenic relationships between these living organisms, following the pattern of evolutionary trees. Morphological criteria were replaced by biochemical criteria, then molecular criteria, which were more neutral but infinitely more fertile.

Certain biological disciplines in the third group also use molecular tools, for example, population genetics, which has followed and used the advances of the parent discipline, or ecology.

The most characteristic feature of contemporary biology is the deep-seated unity that has developed around the tools and concepts of molecular biology. The first stage occurred in the 1930s when zoology embraced Darwin's theory of evolution and population genetics. It was not an easy marriage, as was seen in the thirty years needed for the full merger, which was given the name of neo-Darwinism. Darwinians initially believed that the variations on which natural selection operated were small in amplitude, while geneticists, who dubbed these variations mutations, considered them, from the very earliest stages of the discipline, to be large and important. Only the mathematical tools of population geneticists managed to convince geneticists that tiny variations could, under constant and long-lasting pressure, produce major modifications. Neo-Darwinism has changed enormously since it first appeared, although, for many years, the growth of molecular biology had little effect on it. Very slowly, molecular biology provided the tools needed to track the molecular evolution of living beings; and it has only been in recent years, with the isolation of development genes (homeotic genes being the first ones discovered and still the most famous) that molecular biologists have 'handed over' to evolutionary specialists the genes presenting variations in structure and function so essential to the understanding of the evolution of living beings. With additional influence from the neutralist theory put forth by the Japanese geneticist Kimura, neo-Darwinism is changing greatly, although its basic principles have not been challenged. It is losing the 'Pangloss' element, by which an adaptive value is attributed to every variation surviving throughout evolution, and is becoming more attentive to genetic (or other) constraints restricting the diversity of living organisms. Neo-Darwinism takes into consideration recently discovered mechanisms, which, in living beings, modulate genetic variability as a function of environmental conditions. The synthesis of theories of evolution, development biology, molecular biology and cell biology will probably be one of the objectives and the success stories for biology in the twenty-first century.

## THE STRUCTURE AND DYNAMICS OF THE EARTH

This section looks at the different advances in geology and geophysics, and focuses on points related to the structure and dynamics of the internal movements of the Earth. By the late nineteenth century, scientists had come to accept that the Earth was configured in successive concentric layers. The twentieth century contributed to our knowledge about the chronology of various periods (the 'ages of the Earth') and saw, by the 1960s, the development of a genuine theory of dynamics for the movements of the Earth's crust and mantle, called plate tectonics.

### The age of the Earth

In the late nineteenth century, estimates of the Earth's age were based on conventional physics measuring heat exchanges and heat losses (see the calculations by the physicist, William Thomson-Kelvin): considering that the crust of the Earth had been cooling down from a point of initial heat, the estimate was only around 100 million years. New data about radioactivity led to revisions of these under-estimates, suggesting the idea of a source of energy within the Earth in the natural radioactivity of rocks. A more realistic evaluation of geological times was made in 1917, by studying the quantity of helium released as a product of uranium decay. Radio-dating techniques were then improved using various radioisotopes such as argon, potassium-40 and, after the Second World War, carbon-14.

Generally speaking, developments in geology have always been highly dependent on advances in related fields, such as the chemical analysis of rocks, mineralogy, palaeontology, plus geophysics and geochemistry, which all made great strides in the course of the twentieth century.

### From continental drift to the theory of plate tectonics

The greatest step forward in Earth sciences has been the advent of *plate tectonics*. This was a revolutionary discovery because it showed a mobile instead of a fixed Earth, while providing a mechanism for its movements and reorganizing the most diverse elements of knowledge around the dynamics of transformations in the Earth's crust – with continental shifts, seismic activity and new mountain ranges forming.

This theoretical revolution, backed by many observations including exploration of the ocean floor, substantiated the 'old' hypothesis of the *continental drift* already formulated by Alfred Wegener in 1912. Wegener suggested that the continents we know today originally came from a single, southern pro-continent, *Pangaea*, that split into parts that migrated across the mantle over a period of hundreds of millions of years.[89] Substantiating his theory, Wegener argued that there were morphological properties such as the coastal profiles of the continents that seemed to fit together, e.g. the Brazilian and West African coasts, and that even though the ocean extends for 4,000 kilometres between the two, they share numerous geological, palaeontological and palaeoclimatic features.

Because no dynamic cause could be found to account for the drift, and given the conservative attitude of most geologists of the time, who were unwilling to abandon the idea of a fixed Earth, Wegener's theory attracted only marginal interest before 1960.

However, topographic and geological studies of the oceans conducted in the 1950s showed that their sedimentation was recent and that they shared an underwater mountain range, i.e. ridges or mid-ocean *rifts*. Around 1960, Harry Hess proposed the idea that the ocean floors were

spreading with convection currents and changing the mantle. Seismology, measurements of magnetic anomalies caused by the appearance of lava beneath sedimentary layers, plus palaeomagnetic data (studying time-related variations in the magnetism of rocks) showed there had been inversions in terrestrial magnetism and magnetic poles. All these findings changed views and perspectives on the dynamics of the Earth's crust and led back to the continental drift hypothesis. The idea was revived and transformed into the now universally accepted theory of plate tectonics for ocean and continental plates.

J. Tuzo Wilson presented the concepts of plates and transform faults in 1963, while Jason W. Organ, Dan MacKenzie and Xavier Le Pichon described the mechanism of plate tectonics (1967–68). They argued that the Earth's crust comprises rigid plates shifting in relation to one another, and that new plates, forming as a result of volcanic activity along the ridges, eventually take the place of the old ones. Ocean plates go down deep beneath the continental plates where they collide with one another, causing mountains to rise up; the Himalayas emerged when the plates of India and Asia collided, and the Alps were formed from the collision of the African and European plates. This theory, which accounted so coherently for changing geological and geophysical phenomena, produced predictions that could be verified by observation.

Plate tectonics therefore enabled scientists to reconstitute the past movements of the Earth's crust as a vast series of fragmentations, slides, shifts, turnings and collisions of continental masses occurring from the force of the spreading oceans. A primitive supercontinent named *Rodinia* may have been the beginning of today's continents: it formed some 1,200 million years ago (mya), then broke up into fragments that gathered to form two megacontinents, *Laurasia* in the north and *Gondwana* in the south. *Gondwana* was formed 600 million years ago, and between 390 mya and 210 mya merged with the *Pangaea* supercontinent which formed as an aggregate of all the continents and was surrounded by a single ocean named *Panthalassa*. After Pangaea split up, Gondwana broke up again, circa 170 mya, with the opening up of the Atlantic, Indian and Antarctic oceans, producing the southern sub-continents: Africa, South America, India, Australia and Antarctica.

### Earth sciences and planetology

All sciences related to the properties of the Earth, such as meteorology, oceanography, geology, geochemistry and geophysics, seismology, volcanology and terrestrial magnetism, have gradually moved closer together over the twentieth century to form a synthetic perspective that views phenomena in a coherent relationship governed by the dynamics of the planet Earth. These disciplines have been grouped together in the field now known as earth sciences.

Another development occurring in the final decades of the twentieth century was the interaction of the Earth with space. Knowledge of other planets in the solar system plus systematic exploration through space missions meant comparisons could be made; it became possible to study the composition of other planets (particularly the rocky planets such as Mars, Venus and Mercury, not to mention Earth

and its satellite, the Moon). Earth sciences were thus extended to include planetology. Recently acquired understanding about the impact of celestial bodies in collision has shown how important planetary dynamics is. These sciences and planetology in turn now belong to the much broader group of disciplines referred to as earth sciences and sciences of the Universe.

The history of the Earth's formation also falls within the scope of astronomy, which has provided data on the age of rocks and calculated that the Earth and other bodies in the solar system are the same age, i.e. 4.5 billion years. The Earth and the other bodies in the solar system were formed from the sole impact of universal gravitation, starting from a cloud of gas and dust released from the explosion of a star (supernova), and ending up as part of a process that generated everything from the nuclei of the atoms in chemical elements, right down to the heaviest elements such as iron and uranium.

As for the astronomic and geological histories of the Earth, these disciplines have evolved into a different kind of natural history, the history of the biosphere, discussed below.

## RESEARCH ON THE ORIGINS OF LIFE

While the human race, with its diverse cultures, has always been interested in its origins and in the creation of the surrounding cosmos, the tale has usually been recounted in legends and myths in poetic and supernatural terms. The question of origins has only gradually become a subject for scientific exploration, and even this has occurred in quite different forms, depending on whether it deals with the origins of the human species (human palaeontology), the origins of the Universe (a very recent focus for science, dating from the cosmology of the expanding Universe), or the origins of life. For the origins of life, a problem arises in the formulation and indeed the definition of the term 'life'. No scientifically satisfactory definition existed until molecular biology advanced one during the second half of the twentieth century. The science of the origins of life has now achieved legitimacy and been given its own name: exobiology. The notion of a 'fixed Earth' has been abandoned, and new issues are becoming the subject of modern scientific research.

By objectifying nature, humans have grasped both their distance from nature and the inclusion of humans in this world as an element of nature. The twentieth century has thus completed the movement away from the single centre that characterized the beginnings of modern science: not only were humans and their habitat no longer the centre of the Universe, but nothing in the Universe remained fixed and established once and for all, be it living forms, the Earth, or the cosmos. Everything was movement and change.

Human beings have reached an unprecedented degree of awareness that life on Earth is merely 'a flash in the night of the Universe'; yet despite their precarious natural situation, they continue their questionings, seeking answers and meanings that may help them transcend the situation. While many of these questions have moved into the realms of science, they have nonetheless retained some of their metaphysical force, and here they may also coincide with the very why and wherefore of science itself.

## The history of life on Earth and the origins of the human species

The history of life on Earth has now been given its timeline: the oldest fossil evidence sets the beginning shortly after the formation of the Earth and solar system 4.5 billion years ago. The first bacteria appeared approximately 3.5 billion years ago, the first *eukaryotes* (cells with a true nucleus) approximately 1.5 billion years ago, and the colonization of continents by plants and animals, with animals acquiring lungs and limbs, began 500 million years ago (the first terrestrial plants circa 435 mya, the first reptiles 345 mya and the first mammals 225 mya). Mammals became dominant once dinosaurs had become extinct after the sudden and dramatic climate changes that started circa 60 mya.[90] Placental mammals first appeared circa 100 mya, then primates circa 70 mya (with, *inter alia*, a larger brain and smaller face, opposable thumb and developed eyesight), and apes in Africa and South America circa 40 mya. *Oreopithecus*, circa 15 mya, walked on two legs, having acquired the biped gait in response to ecological pressure. *Ramapithecus*, a small primate that may have used tools, was present from 20 mya to 7 mya in the Old World (Europe, Africa, Asia), and is possibly an ancestor of the *hominid* lineage.

The human species appeared more recently, although much earlier than was believed at the turn of the twentieth century: approximately 3 million years ago. Many discoveries in the field of palaeontology have been decisive and contributed to the considerable progress made in improving our understanding of the origins of the human race; these advances came about with the transdisciplinary approach in the different fields of natural human sciences: i.e. human palaeontology (or palaeoanthropology), anthropology, ethnology, prehistory, and the use of techniques developed by exact sciences such as physics and chemistry. With improvements in methods used to conduct archaeological digs, better dating techniques,[91] and in particular advances in geology and stratigraphy, plus the discovery of many human fossil remains, estimates on past human history have been pushed back in time and have revealed links in the family of primates and, even further back, in the series of animal species. Animal palaeontology and palynology (the study of spores and pollen) were extended and applied to learning more about climatic and ecological contexts, and have led to a better understanding of the lifestyle of the first human beings.

The discovery of *Australopithecus* in southern Africa (Kenya) in 1934 prompted scientists to date the first hominid at one million years ago, but this estimate was revised in 1974 to 3.5 mya, following the discovery of the remains of the slender *Australopithecus* 'Lucy' in the Omo region of the Ethiopian Afar geological basin. *Homo habilis* lived in society, manufactured tools, went from a vegetarian to an omnivorous diet, and was the first species to build dwellings built as proper structures; these are approximately 1.6 million years old. From 1.9 mya to 1.5 mya, *Homo erectus* spread throughout Africa, Asia and Europe. *Pithecanthropus* (with one group, the *Sinanthropus*, discovered in China in the 1930s, and 500,000 years old) was the first to use fire. *Neanderthal man*, first identified in the nineteenth century (1864), buried his dead; he first appeared around 400,000 years ago and disappeared 40,000 years ago, but left no direct descendents, while *Homo sapiens*, who was present in the early Upper Palaeolithic (circa 200,000 years ago), left *Homo sapiens sapiens*, identified through fossil remains of Cro-Magnon man, who decorated caves, was similar to modern humans and lived in the Magdalenian period, the time of the gradual glacial recession of the last Würm ice cap and the slow migration of cold fauna (35,000–10,000 years ago). Human settlement then spread to the five continents, and differentiations between humans became cultural rather than morphological: humans today comprise a single species and, strictly speaking, a single human race, with different groups and crosses. The question of the origin of the human species encompasses both the issue of morphological changes and the question of the growth of the human brain and its capacities, and specifically the development of the power of speech.

## The question of the origins of life

The question of the origins of life has been addressed in science with Darwin's theory of evolution as the breakthrough point on species and their evolution in time. The uniqueness of matter suggests there is continuity in the shift from minerals to living organisms and that life is a property that 'emerges' from the organization of matter. This also raises the question of how to define living organisms, which has only now found an answer through molecular biology. Nevertheless, very fertile and stimulating enquiries were being made well before the 'true' nature of the phenomenon of life was understood.

It was accepted that the origins of life on Earth were connected to the history and origins of the planet. The atoms making up the planet, including those that provide the basic material for living molecules (the main chemical elements: oxygen, hydrogen, carbon, sulphur, phosphorous and also the heavier metals, calcium and iron), were synthesized in a star and subsequently scattered throughout space with the supernova eruption, before reforming as a planet (Earth) in the solar system due to the effects of gravitational pull. The primitive atmosphere of the Earth that later formed with the release of gases from the Earth's mantle also resulted from the bombardment of meteorites, ultraviolet radiation, high natural radioactivity releasing energy, intense earthquake activity, volcanic eruptions and the greenhouse effect resulting from carbon dioxide. These processes also led to the formation of the first oceans. There are doubts as to whether the Earth's first atmosphere was a reducing (methane) or oxidizing one (carbon dioxide), however Earth's present atmosphere is largely the result of the action of living organisms; it can be supposed that, through chlorophyll photosynthesis, microscopic primitive algae produced an abundance of atmospheric oxygen.

Given the openness of living systems, they are subjected in both their constitution and development to the influence of the physical conditions in the outside environment. These conditions have been determining factors in the origins of life itself. It is quite likely that the first living structures developed from interactions between complex molecules in certain chemical and thermodynamic conditions, which polymerized them to form protein chains.

Hypotheses and models were formulated and scenarios devised – using physico-chemical processes starting with inanimate mineral matter – to account for the formation of organic matter and elementary living organisms. Prebiotic

chemistry focuses on the conditions of the primitive mineral Earth, and particularly its oceans and atmospheres, whose chemical constituents were instrumental in the synthesis of increasingly complex organic molecules that eventually gave rise to living micro-organisms.[92]

Efforts to provide physical and chemical explanations to the origins of life prior to breakthroughs on genes and the mechanisms of heredity have given us certain elements that have also been integrated into recent genetic theories on the formation of life.[93] These theories are built on the trilogy of DNA (genetic code), messenger RNA and protein synthesis.

In the 1930s, Alexander Oparin presented a pioneering theory on the natural synthesis of amino acids. He suggested that through 'biochemical metabolism' these would provide an explanation of how life could have appeared in the absence of oxygen, in an atmosphere composed predominantly of methane. The theory was adopted, with a number of variants, by John Haldane ($CO_2$ atmosphere) and John D. Bernal (life produced in oceans or coastal clays).

Genetic theory and molecular biology have given us the means for going beyond a purely physical and chemical framework, by formulating dynamic theories able to account for the formation of hereditary material and a primitive genetic system. This is now the way origins of life are expressed. The question involves quite diverse disciplines, ranging from astrophysics and geology to physics and chemistry, from molecular biology to the theory of evolution. This borderline issue provides an opportune reminder that divisions separating disciplines are primarily the result of conventions and that fundamental unity does prevail at the heart of the subjects studied in science.

## CONCLUSION

The subjects addressed in this chapter, despite inevitable omissions, have covered some of the significant directions taken by science in the twentieth century. We have noted the gradual changes or complete breaks with the past, as well as links and lines of continuity between the different domains of science and between past and present knowledge. In conclusion, we can emphasize some general lessons that may reveal the general direction of future scientific advances and the promises they hold for us.

The *unity of matter* is a principle at the very foundations of all contemporary science and is illustrated in a particularly striking way in the corpus of modern scientific knowledge with its interconnections and mutual dependencies. This knowledge is organized into disciplines according to choices, attitudes and thoughts, and human decisions made in response to intellectual or practical requirements. They allow problems to be arranged in series, defining affinities among different subjects, and making it easy for us to approach the material world according to different levels of formal organization. The very concepts of *levels* and *organization* are part of the general frameworks or categories of thought on which knowledge and understanding are built.

Any definition and demarcation of disciplinary borders are eminently mobile: disciplines come together or diversify and new disciplinary fields are established; this appears as a general law applying to the organization of sciences. But while the 'total' category may no longer strike fear into the

hearts of today's scientists, methodological caution is still required (scientific *noblesse oblige*), and any moves they have accepted in coming together are invariably imposed by the logic applying to their work or to the subjects of their study.

Another lesson science has taught us through its very existence and its constantly changing nature is that science cannot be reduced to its achievements at any given point of time in history. It is first and foremost thought, but it is also *practice* and *work*, both intellectual and tangible, plus the potential for practical application. The problems raised by science range from internal questions related to the content of knowledge to issues of social responsibility, ethics and political implications. To be properly addressed, these general questions must be considered in the same spirit of discernment and critical reason required in science, but without being reduced to the level of science subjects, for they are issues of a different kind, linked to systems of values which are not to be found in nature. These vary depending on the science in question and, for some, like mathematics and the so-called 'exact' sciences reviewed here, reference can be made to an 'epistemological fence' which, starting from a threshold of 'guaranteed' knowledge, can be used as a conceptual approach to content that appear unaffected by other circumstances.

Science as thought (considered on a regional basis for each discipline, as well as on a more general basis) is part of a movement developed not only by the problems posed but also by the questioning of the content and meaning of the knowledge acquired. By focusing on description and explanation, science has invented new forms of understanding; it has revealed positive elements, describing phenomena and explaining the reason for their existence. With its own impetus, science strives to understand the relationships between these phenomena and to relate them to another deeper structural link derived from the subjects, by setting them into an intelligible pattern. These elements often have substantial implications for the general level of ideas, such as our concepts of space and time, or the principles underlying the laws of physical or biological phenomena.

But science also implies a representation of the world, going beyond mere reporting on relations and phenomena. This means creating new ways of thinking and conceptual innovations: science is then seen as work involving thinking and the sum total of acts of creative intellectual effort. While science is constructed (in the sense of constructing symbolic representations), it is also a critical thought process, raising problems of interpretation that are sometimes directly philosophical in nature. Proofs can be found, for example, for the curvature of space and the general theory of relativity, or concerning the question of 'physical reality', a subject of great debate in quantum mechanics. There are even proofs for certain aspects of cosmology and life sciences, such as the relationship between minerals and living organisms, evolution and the question of origins, or indeed, extending to a more general context, concerning the question of the nature of theoretical thought and its relationship to observation and experimentation.

Experimentation has been shown to be increasingly based on prior theoretical developments. The role of mathematics in physics is not for simple applications; mathematics is seen as a constituent of physical thought, being particularly well suited to displaying the structural aspect of the real physical

world, because of the qualitative approach and focus on relations, which is not solely concerned with quantity in the narrow sense of magnitude. The growing importance of topology in theoretical physics, along with metrics, may be significant here.

Deeper study of the nature of scientific work as an intellectual activity will inevitably reveal the close relationship with the philosophical attitude, alongside the huge technological resources needed for this work today. Looking beyond the formal changes over the past century in activities related to scientific knowledge, this dimension of science is probably the aspect most likely to ensure its ongoing sustainability and relevance, through its inability to settle for a closed representation and its irrepressible urge to doubt, criticize and start all over again.

## NOTES

1.    Dynamics: the effect of a particular type of force (e.g. electromagnetic dynamics or gravitational dynamics).

2.    Independently of the motion of its source. The speed of light in a vacuum is usually denoted by the symbol $c$, used hereunder.

3.    Vectorial addition, using the three space coordinates.

4.    For two collinear speeds, $u$ and $v$, their composition is
$$V = \frac{u+v}{1+\frac{uv}{c^2}}.$$
If one is the speed of light $u = c$ and $V = 0$).

5.    Low compared to the speed of light.

6.    An unstable particle known as a *muon* decays, having a life lasting 1 microsecond ($10^{-6}$ s), and has to cover a few kilometres ($10^{-6}$ m) before reaching Earth.

7.    $x_4 = ict$, with $i = \sqrt{-1}$.

8.    In this four-dimensional universe, Lorentz's transformations are rotations of the four coordinates, leaving 'distances' as invariants. The *metric* for this hyperspace (or Minkowski's universe) then featured an invariant element for 'distance', $ds^2 = dx_1^2 + dx_2^2 + dx_3^2 - c^2dt^2$, with the *signature* $(+,+,+,-)$ being the signature of a *quasi-Euclidean* space. In space-time, any action propagated at the speed of light covers spatial distance $x$ in time interval $t$ so that $x = \pm ct$. This equation defines the 'light cone'. The space-time region inside the light cone (known as 'timelike') is the area of physical actions between two of its points; the area outside (known as 'spacelike') is non-physical, as no pair of its 'four-points' can have a causal relationship.

9.    The quasi-Euclidean space-time metric of special relativity (see above) was then replaced by the most general form of metric, $ds^2 = \Sigma g_{\mu\nu}dx_\mu dx_\nu$. Here $x_\mu$ and $x_\nu$ are the generalized coordinates of space-time, and the functions $g_{\mu\nu}$ (such magnitudes with a number of indices are tensors) are the metric at each point.

10.    Einstein's equation links the metric tensor to the energy-momentum tensor of matter.

11.    An extra 43' of arc per century.

12.    Energy exchanged ($\Delta E$) is proportional to the frequency ($v$): $\Delta E = nhv$, $n$ being a whole number, and $h$ a constant of very small numerical value ($h = 6.55 \times 10^{-27}$ erg. sec), is the 'quantum of action' or 'Planck's constant'.

13.    Radiation energy is proportional to its frequency: $E = hv$. This relationship was verified with observations of the photoelectric effect.

14.    These negatively charged particles had been detected by Joseph J. Thomson in 1896.

15.    The relationship between momentum or the quantity of motion and the wavelength is:
$$p = \frac{h}{\lambda}.$$
Arthur Compton proved this in experiments in 1923, studying the collision of a photon with an atomic electron ('the Compton effect'). The radiation particles were named 'photons'.

16.    This means that every particle has a characteristic frequency related to its energy
$$(v = \frac{h}{E})$$
and a wavelength related to the quantity of motion
$$(\lambda = \frac{h}{p}),$$
in accordance with relationships previously established for radiation.

17.    Their intrinsic angular momentum or 'spin' is integral or zero (as a unit of the quantum of action $h$ or rather
$$\hbar = \frac{h}{2\pi}),$$
the spin of light (the photon) being 1: this feature has since been used to define one of the classes of quantum particles, the 'bosons'.

18.    In conventional statistical mechanics, particles, even when identical, are discernable.

19.    Fermions are half-integer 'spin' particles (units of the quantum of action): e.g. electrons have spin
$$\frac{1}{2}\hbar,$$
with two possible directions in a magnetic field.

20.    Two numbers, $x$ and $y$, commute: $xy - yx = 0$. Two matrices, $A$ and $B$, do not commute: $AB - BA = 0$. $\psi$. A matrix, or any appropriate linear operator, operating on the state function, produces an 'eigenvalue equation', such as $A\psi = a\psi$, $A$ being the operator (e.g. the Hamiltonian $H$ being energy), and $a$ the eigenvalue (a real or complex number).

21.    This probability is calculated as the square of the module (or absolute value) of the state function ($|\psi|^2$).

22.    The same state can be determined independently using another set of this type with quantities that do not commute with the first ones (incompatible or complementary systems). It was also shown that these operators could be constructed using equivalent classical numerical quantities as generators of infinitesimal transformations.

23.    $h$ being finite (non nil).

24.    EPR being the initials of the authors of an article published in 1935 in the *Physical Review*: Einstein and his colleagues, Boris Podolski and Nathan Rosen.

25.    Over the period 1964–1981.

26.    All that is needed, for example, is a highly rarefied beam with well-defined temporal distribution: it is known that, in a given time interval, one single particle goes through an interferometer.

27.    The exact value today for Avogadro's number is $N = 6,022 \times 10^{23}$.

28.    The corresponding quantum numbers being denoted, respectively, by $n$, $l$, $m$ and $s$; their possible values are determined by specific quantum rules. The spin of the electron can be aligned in one of two directions.

29.    *X*-rays have very short wavelengths of the magnitude of atomic distances and produce interferences in crystalline networks.

30.    With Hans Bethe, Eugen Wigner, John Slater, Nevill Mott and Harry Jones.

31.    Transistors are used in integrated circuits; with continuing miniaturization, they have now shrunk to a few tenths of a micrometer (chips).

32.    The absolute temperature scale has zero at $t = -273.16$ degrees Celsius, i.e. the temperature of 0 °C corresponds to $T = 273.16$ K.

33.    Superconductivity was discovered in the early twentieth century by Kamerlingh Onnes, working with mercury, and has since been explained by quantum theory. It is of considerable practical use: when used in electromagnetic circuits, it can produce intense magnetic fields without any loss of current, and is now used in large particle accelerators. Critical temperatures currently used are relatively low. But the possibility of finding materials which could be superconductors at temperatures closer to ordinary temperatures would open the path for an ever more prodigious range of applications, for example, magnetic levitation trains moving without any friction.

34.    In his theoretical work on monoatomic gas atoms ('boson gases'), based originally on an idea proposed by Bose.

35.    To achieve extreme cold, lasers are used, their light trapping the atoms in a magnetic field so that they cannot retrieve their kinetic energy.

36.    The dimensions of the nucleus are of the magnitude of $10^{-13}$ cm (1 fermi), while the distances at the atomic level are of the magnitude of $10^{-8}$ cm.

37.    The structure of the nucleus was then explained in terms of atomic masses (A) and atomic numbers (Z): a nucleus contains $Z$ protons and A-Z neutrons, and its mass is equal to the sum of the masses of the constituents minus their binding energy

$$(m_N = Z.m_p + (A - Z).m_n - \frac{\Delta E}{c^2}).$$

It was then possible to simply draw up the balance of energies expended or released in nuclear reactions.

38.    Isotopes are atoms with the same chemical properties and atomic number, but a different mass number: their nucleus has the same number of protons and a different number of neutrons. For one given stable element, there can be radioactive isotopes, which are unstable (because of the excess of neutrons): hydrogen, deuterium (both being stable) and tritium (radioactive) are isotopes. Carbon-14 (6 protons and 8 neutrons) is a radioactive isotope of stable carbon-12 (6 $p$ and 6 $n$).

39.    In these reactions where the total mass of the products is smaller than the initial mass, the difference in mass is turned into released energy.

40.    Thermonuclear fusion would still raise problems, as is the case with fission in today's nuclear power stations, for safety and the disposal of highly radioactive waste.

41.    In atomic and subatomic physics, energies are expressed in multiples of electron-volts (eV): keV (kilo eV, i.e. 1 thousand keV), MeV (1 million eV), GeV (G for giga, billion, $10^9$ eV), TeV (1 thousand GeV, i.e. $10^{12}$ eV).

42.    Binding energies at the atomic level range in magnitude from the electron-volt (eV) to the keV.

43.    For each particle there is potentially a corresponding anti-particle of the same mass and opposite in charge. The excitation of nuclear matter, by using sufficient energy, can produce a particle-antiparticle pair. The antiproton (with mass close to 1 GeV) was produced and identified this way in 1955 by Owen Chamberlain, on the Bevatron at Berkeley (6 GeV energy).

44.    From a few MeV to a few hundred MeV.

45.    One GeV and above (TeV by the late twentieth century).

46.    Gravitational force plays no role in atomic and subatomic physics because of the tiny scale of the gravitational constant. It does, however, come into play in a highly specific area, with very high energies in the first instants of cosmology, to be discussed below.

47.    $\beta^-$ radioactivity is expressed as an elementary process, in a nucleus: $n \rightarrow p + e^- + \bar{v}_e$. (A neutron decays into a proton, an electron and an antineutrino). The basic idea is that the transformation of a neutron into a proton goes with the transformation of a neutrino into an electron (according to Dirac's theory and quantum field theory, a neutrino destroyed is the same as an antineutrino created).

48.    The $p$ meson, which is present in a 'virtual state' in the nucleus, can be created in nuclear interactions by introducing mass, i.e. energy, according to the mass-energy relation $E = mc^2$. The concept of a 'virtual particle' comes from the *quantum field theory* which states that a physical vacuum is comprised of virtual particle-antiparticle pairs, having two physical consequences: vacuum polarization, as proven by the Lamb effect, and endothermic production of particles, confirmed by the possibility of producing particles providing sufficient energy.

49.    These resonances have an extremely short lifetime: approx. $10^{-22}$ s. Electromagnetic decay means a lifetime from $10^{-16}$ s to $10^{-18}$ s, while for a weak force it is $10^{-13}$ s and above.

50.    Formulated by Tsung Dao Lee and Chen Nin Yang and confirmed in experiments conducted by Chien Shiung Wu.

51.    Baryons have spin $\frac{1}{2}$ and $\frac{3}{2}$, mesons have spin 0, 1, 2 (in $\hbar$ units).

52.    *SU(3) symmetry* was postulated in 1962 by Murray Gell-Mann and Abraham Pais, and the idea of three *quarks* is the work of Murray Gell-Mann and George Zweig.

53.    The flavours of the three quarks are isospin 'up', 'down' and 'strange', giving the symbols *u*, *d* and *s*. Quarks have spin $\frac{1}{2}$ and fractional electric and baryonic charges ($\frac{1}{3}, \frac{2}{3}$). In this representation, mesons are quark-antiquark combinations, *baryons* are three-quark combinations (*uud* for the proton, *udd* for the neutron, etc.).

54.    Each flavour, corresponding to a distinct quark, determines a family of particles with a characteristic flavour: in addition to nucleons and *p* mesons and their excited states (distributed as electrically charged multiplets reduced to the *isospin* and comprised solely of *u* and *d* quarks), are the *strange* hadrons (with at least one *s* quark), discovered and studied in the 1950s and 1960s, the *charmed* hadrons (with one *c* quark) of the 1970s, then the *B* and *T* hadrons (incorporating respectively *b* and *t* quarks), identified in the 1980s and 1990s. These hadrons are ranked higher up the mass scale, and correspond to masses that could be assigned to elementary quarks: small for *u* and *d*, and increasingly higher for *s*, *c*, *b* and *t*.

55.    The six quarks have been given the following names: *u* (isospin up), *d* (isospin down), *s* (strange), *c* (charmed), *b* (beauty or bottom), *t* (truth or top).

56. Research by Aage Bohr, Ben Roy Mottelson and L. James Rainwater.

57. The development of series perturbations occurs following the increasing power of the 'coupling constant' measuring the intensity, which is small compared to unity: the series decreases quickly.

58. The 'Lamb effect' or 'Lamb shift' is the difference in certain fine structure levels of the hydrogen atom in relation to the values calculated (using Dirac's equation): the effect is actually caused by a 'cloud of virtual photons' or 'vacuum polarization' which quantum electrodynamics deals with by renormalization.

59. This term is purely metaphorical: the superposition of the three colours is neutral and colourless.

60. The idea of the mechanism, which was then generally adopted for studying symmetry, was actually the work of Brout, Englert and Higgs, who presented it in 1971.

61. A 'current' of particles expresses the transition from one state to another at the time of the interaction with the field: an electron interacting with an electromagnetic field emerges with no charge exchange (neutral current); but a neutrino turning into an electron in its coupling with the weak field, produces a charged current.

62. CERN: European Organization for Nuclear Research, near Geneva. The first reaction observed, a rare occurrence given the low probability, was: $\nu_\mu + e^- \rightarrow \nu_\mu + e^-$. Another and more frequent reaction is: $\nu_\mu + p \rightarrow \nu_\mu + p$ (the corresponding charged-current reaction is $\nu_\mu + n \rightarrow e^- + p$).

63. $q$ denoting quarks $u$, $d$, $s$, $c$, $b$ and $t$.

64. Two colour quarks $q_i$ et $q_j$ exchange a gluon $g_{ij}$ ($i$, $j = 1$, 2, 3). Studies of nuclear matter and the properties of parton-quarks had previously shown particles other than quarks present inside hadrons, suggesting that they may 'stick' the quarks together, hence their name, 'gluons'.

65. Among the most interesting phenomena revealed by quantum chromodynamics (which now uses them to test predictions) are 'jets' of quarks and gluons, the effect of the kinetic drift of particles emitted in collisions by interacting elementary particles: quark-antiquark fusion. These processes and others of a similar kind show that *valence quarks* are present and indicate the underlying presence of the ocean of virtual quark-antiquark pairs and also of gluons.

66. If the leptonic numbers are linked to the 'flavours' of quarks, each doublet of leptons matches a doublet of quarks ($e$, $\nu_e$ with $u$, $d$; $\mu$, $\nu_\mu$ with $s$, $c$; $\tau$, $\nu_\tau$ with $b$, $t$). This structure of elementary fermions divided into three families with universal coupling with interacting fields is probably due to an underlying and as yet unknown fundamental property. The number of these families is limited to three because of certain constraints: all quarks and leptons are now known.

67. Initially 'massive compact objects'.

68. These astronomical beacons emit radiation at radio frequencies with a periodicity of a few tenths of a millisecond, produced by the extremely fast rotation of the star around its axis: when the star collapses in on itself, the initial kinetic moment is retained, the effect being, as when skaters spin, a considerable increase in the speed of rotation. One of the best-known pulsars is the Crab Nebula, a remnant of the supernova seen in 1054 and recorded at the time by Chinese astronomers.

69. At the end of its life, a star produces a *supernova* if its mass is approximately ten times the mass of the Sun. One supernova is produced in each galaxy about once a century.

Supernovae also emit gravitational waves which, in theory, should be detectable and will no doubt be observed in the first years of the 21st century (see above, on general relativity). Once the iron core goes beyond a certain limit ('Chandrasekhar limit'), it collapses in on itself, and the outer matter is violently ejected.

70. Because of the weak interaction capacity of neutrinos, these are huge and positioned under thick layers of matter (in mountain tunnels, at the bottom of mine shafts, or even in submarines), for maximum filtering of background noise.

71. Hubble's relation is $z = \frac{\Delta\lambda}{\lambda} = H_0 L$, $\lambda$ being the wavelength, $\Delta\lambda$ the wave shift, and $H_0$ Hubble's constant (re-evaluated in the 1980s and set at 100 kms per s and per megaparsec (1 pc, parsec = 3.26 light-years). The spectral shift is interpreted as a Doppler-Fizeau effect caused by a movement away at speed $v$, $z = \frac{v}{c}$.

72. The proportion of deuterium is 25 per cent.

73. The cosmological principle involves a special form of metric known as the Robertson-Walker metric.

74. These models are mathematical and the term 'singularity' is used with that meaning.

75. Between 50 and 100 kms per s per megaparsec.

76. The most commonly accepted value is in the vicinity of 15 billion years. In 1998, observers using high-resolution telescopes detected two very primitive galaxies on the 'bounds' of the Universe, at 12 billion years or more.

77. That is, $10^9$ times the number of baryons (neutrons and protons) which comprise observable matter.

78. These particles should differ from known particles which had interactions that determined the formation of the Universe as described in the 'cosmology of the first instants'.

79. The grand unification field from $10^{-43}$ s to $10^{-35}$ s, the dissociated chromodynamic and electroweak fields from $10^{-35}$ s to $10^{-32}$ s with a predominance of quarks and leptons, then the three separate fields (strong, electromagnetic and weak) from $10^{-32}$ to $10^{-12}$ s with a 'soup' of particles and antiparticles; next, from $10^{-12}$ to $10^{-6}$ s (one microsecond), matter is a broth of particles and radiation; on cooling, after approximately three minutes, matter is converted into hydrogen, deuterium and helium nuclei (this is the radiation era when matter and radiation uncouple, with the cosmogenesis of light elements); around 100,000 years, the nuclei attract electrons, forming atoms, emitting isotropic electromagnetic radiation.

80. Starting in the late 17th century with the mechanics in Isaac Newton's *Principia*, until the late 19th century with James Clerk Maxwell's electromagnetic theory, and covering the 18th century with work on fluid mechanics by Jean d'Alembert and Leonhard Euler, and Joseph-Louis Lagrange's *Analytical Mechanics*.

81. The bomb was developed in the Los Alamos Laboratory, in the United States, between 1942 and 1945. At the same time scientists learned how to control the production of nuclear energy, with the first atomic pile used to enrich uranium with fissile matter and transform it into plutonium: nuclear piles and reactors were subsequently designed to generate electricity. Nuclear physics and elementary particle physics as we know them today are the direct result of this history so closely bound up with the political situation. The paradox is that today, with the establishment and operation of CERN (the European Organization for Nuclear Research) near Geneva, on the

border between France and Switzerland, they provide a model for international scientific cooperation and partnership, conducted in a spirit of peace, but also with direct involvement of the different states. However, as research into subatomic physics has gone deeper, knowledge has moved away from practical applications, which are now mainly seen as the domain of industrial technology.

82.  Ranging from electrostatic accelerators with protons and light nuclei to heavy ion accelerators first developed in the late 1960s.

83.  Ranging from cyclotrons and linear electron accelerators to proton synchrotrons and proton-antiproton and electron-positron collider rings.

84.  One of the great advances in this field in recent times was the achievement of the technique known as stochastic cooling developed by Simon van der Meer, which made it possible to use controlled beams of antiprotons in the $p - \bar{p}$ collider ring at CERN, an essential tool in the early 1980s for producing and identifying intermediate bosons, as mentioned above.

85.  Visual detectors, photographic emulsions, Wilson chambers and bubble chambers, electronic detectors, Geiger counters and multi-wire proportional chambers developed by Georges Charpak: these were the forerunners of the large 'drift' wire chambers and three-dimensional designs; since the 1980s, these have replaced the other high-energy particle detectors. These chambers can be used together with particle identifiers and 'calorimeters' to measure energy for full reconstition (on-line, on computer) of the most complex reactions, thus combining the advantages of the precision visual detection previously used and the statistical accumulation of electronic detection data.

86.  This acuity, which the designers say gives visibility capable of distinguishing a pea at a distance of a thousand kilometres, is increased by sophisticated optical interferometry techniques first developed in 1976.

87.  Special infrared telescopes also exist.

88.  NGST: New Generation Space Telescope.

89.  Alfred Wegener, *Die Entstehung der Kontinente und Ozeane*, 1915 (and the expanded 1929 edition). Eduard Suess (author of *Das Antlitz der Erde*, 3 vols., 1883–1909), who described the crust and mantle of the Earth in terms of sial and sima, had previously suggested to Wegener that an original southern continent named *Gondwana* had existed, joining Africa to India. But as he had adopted the argument that the cooling of the crust would cause contraction, he interpreted the morphological complementarity of the coasts as continents collapsing. Reference must also be made to the important work by Émile Haug (*Traité de géologie*, Paris, 1907–11) on structural geology and geosynclines, which are marine sedimentation depressions that sank deeply over long periods and, according to Haug, had heaved, moving upwards and causing mountain ranges to form.

90.  These changes, according to one of the most widely supported hypotheses, were caused by the impact of a giant meteorite; the crater was identified in Mexico and analyses detected traces characteristic of iridium.

91.  Relative dating (establishing contemporaneity) and absolute dating using radioactive substances, including radiocarbon (the carbon-14 method devised in 1949) for organic matter, can be used for periods up to -40,000 years. For much earlier periods, other radioactive substances, found in eruptive or sedimentary rocks, are used.

92.  This synthesis may have occurred in other environments, e.g. meteorites in space, these being the fossils of the primitive matter in the solar system, with many organic molecules, or even other planets and their satellites, which can help determine the physicochemical conditions of the primitive Earth.

93.  See, e.g., Graham Cairns-Smith's theory of genetic take-over, i.e. that a clay (mineral), playing the role of a primitive enzyme, may have catalysed the polymerization of the molecules absorbed on the clay surfaces in the form of laminae, at the point where earth and water meet; the polymer chains thus formed could have then acquired a permanent capacity to reproduce autonomously.

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# 14

## SCIENCE AS A SYSTEM OF IDEAS
## FIRST HALF OF THE TWENTIETH CENTURY

### *Ludmila A. Markova*

In the twentieth century, there emerged a veritable confraternity of scholars – sociologists, philosophers and historians – engaged in specific areas of research in the social sciences. This confraternity was based not only on a shared object of study, but also on a wide range of social factors. The latter include a common language (the overwhelming majority of works are written in English), a common territory (mainly Western Europe and North America), and the opportunity to meet and exchange ideas at conferences, seminars, by student and professor exchanges and the preparation of joint publications, etc. Thus, we can speak of the existence of an integrated community of researchers who, through their combined efforts, reflect the state of twentieth-century study. Naturally, this community does not exist in isolation. The discussion of any serious issue can prompt the members of this community to examine the history of their own or outside disciplines or to engage in ideological disputes.

Consequently, research also reflects the opinions of non-professionals. Natural scientists, writers, politicians, economists, etc., express their views on science. Their viewpoint is often of considerable interest, but we shall focus our attention on professional research.

As a rule, the arguments of researchers are conducted along one of two axes. Science may be understood as:

1) a system of ideas within society,
2) activities undertaken to acquire knowledge.

Up to the mid-twentieth century, primarily the first axis was developed, eclipsing activity undertaken to acquire knowledge.

When science is seen as a system of ideas, it is assumed that in their development, these scientific ideas are influenced to some degree by aspects that are external to the ideas themselves (production, politics, religion, etc.). When analysing the way in which science functions within society, the main role is accorded to the outcome of scientific research and its uses by society. Little importance is attached to examining how these ideas emerged as a result of the creative activity of the scientist. Yet, any analysis of the logical structure of scientific knowledge itself is conducted exclusively on the basis of its internal logic, independently of the social or cultural milieu. It was precisely this interpretation of scientific knowledge, which, in the mid-twentieth century, lay at the basis of the two opposing schools of thought in the historiography of science, namely internalism and externalism.

If science is studied as a social institution (universities, academies, research institutes and groups) existing within society, this presupposes a study of the characteristic features of this institution, which has its own hierarchy, personal ethical norms of conduct, individual stimuli and distinctive system of motivation and censure. The social institution of science can exert no more direct influence on the content of scientific ideas than can society in general. The main contribution to the elaboration of this view of science in the twentieth century was made by R. Merton, the founder of the sociology of science.

Until the mid-twentieth century, the philosophy of science was dominated by the positivist school, whose followers reduced the analysis of science mainly to an analysis of scientific language. According to the positivists, the essential concept is that of demarcation, that is, the rigorous separation of science from metaphysics and history. Moreover, they believe that science should be studied by scientists using strictly logical methods and that the most fruitful line of research is the analysis of modern scientific systems without reference to metaphysics. These ideas were given their clearest formulation in the works of R. Carnap, C. Hempel, E. Nagel, and other researchers, the majority of whom were members of the Vienna Circle of logical positivism, which emerged from a seminar organized by M. Schlick at the Department of the Philosophy of the Inductive Sciences at the University of Vienna. The circle ceased its activities following the annexation of Austria by Germany (*Anschluss*) in the late 1930s.

In the history of science, the concept of gradual advance in the development of scientific knowledge has held a central place. In such a cumulative process, each new achievement provides a fuller and more adequate picture of the natural world and more accurate knowledge. A new idea emerges from the preceding idea and becomes the basis for the next advance. The most striking proponent of this view of the history of science was the French historian of science P. Duhem at the beginning of the century.

## SCIENCE AND EXPERIMENTAL KNOWLEDGE – THE PRINCIPLE OF THE ECONOMY OF THOUGHT

When, in the early twentieth century, scholars discussed the relationship between science and society, they usually had in mind not the political, social or economic structure of society, but the experience acquired by men in the course of their everyday activities. How does such experience correlate with scientific knowledge? To what extent are their systems related? Which comes first? How do they relate to each other in the history of humankind and in the life of the individual? Answers to these and other similar questions had been sought in the nineteenth century by the founders of positivism (A. Comte, H. Spencer), and these issues were at the core of the work of E. Mach. All these scholars attempted to identify the shared characteristics of scientific thought and common sense and the link between science and practical experience.

Mach noted that, in the course of our everyday activity, we establish a link between natural processes and our own needs.[1] The satisfaction of needs leads to the emergence of instinctive, involuntary knowledge of the processes of nature that apparently always preceded scientific, deliberately acquired knowledge. Science developed out of manufacturing as a result of the need to pass on the results of the experience acquired in the process of manufacturing to others. This was how science emerged historically, but in the course of its subsequent development, logical, scientific knowledge has always been based on experimental knowledge.

Mach argues that the partly instinctive, partly conscious accumulation of experimental data preceded its scientific systematization. Usually, when we wish to introduce someone to natural phenomena or processes, we do not oblige the person to observe them directly, but we describe this natural process in some way so that the person does not have to undergo the experience. According to Mach, this economy of thought and understanding constitutes the essence of science.

Historically, science emerged as a consequence of the desire to pass on to future generations as economically as possible the knowledge accumulated in the course of practical activities such as to make clothing, weapons, shelter, etc. This economy was achieved by systematizing knowledge, and thus it was gradually given logical, scientific formulation. Scientific knowledge becomes logical and rational only after emerging from experience. The process of the emergence of knowledge is excluded from the rational, logical sphere.

Mach introduced the concept of conditionality and conventionality into scientific knowledge, an area on which Duhem was later to focus his attention. It is precisely these elements of conventionalism in Mach's theory that undermine his initial postulate on the identical nature of everyday and scientific knowledge. Everyday knowledge is something we acquire in our practical activity, which does not obey the logical laws of the development of scientific knowledge but has its own laws of development. The specific characteristics of the development of science do not in any way determine which natural phenomena will interest us in the course of our practical activity. The link between practice and science emerges fortuitously, arbitrarily and unpredictably. Although experience and practical knowledge are the source of scientific knowledge, the genesis of scientific knowledge from experience cannot be logically understood. There is a 'gap' separating practical activity from scientific activity.

## CONVENTIONALISM IN THE CONSTRUCTION OF PHYSICAL THEORY

This gap separating practical and scientific activity is carefully explained in the work of P. Duhem, who distinguishes science from common sense, from the experience acquired in the course of practical activity, from manufacture and production, from civil and political history,[2] thereby placing the emphasis on the logical aspect of scientific knowledge, that is, on one of the characteristics that distinguish it from everyday knowledge.

Duhem follows Mach in recognizing the principle of the economy of thought, and suggests that physical theory is constructed in accordance with this principle. Experimental law replaces an enormous number of concrete facts by abstraction, which ignores the specific or individual aspects in each of these facts in order to extract from them that which they have in common and which is of general significance. Theory is precisely the economic presentation of physical laws and their classification.

The principles or hypotheses, which we formulate in order to systematize facts concentrated in physical laws, are formulated arbitrarily and independently of experience. Mathematical operations are carried out on the basis of these principles independently of any link with experience. If, as a result, the physical theory corresponds to reality, it is quite fortuitous, quite involuntary. To believe that our theory corresponds to the natural order is an act of faith.

According to Duhem, physical theory is not an explanation but rather an image of the natural order. The physicist is unable to prove this, but he 'cannot free himself of the idea' that this is so. Thus an 'irrepressible conviction' of the truth of this view is aroused within him, and he 'is not aware' of this conviction even though he 'senses' that it is correct. The fact that we believe in the predictive power of physical theories is seen by Duhem as the most convincing evidence of our belief that theoretical classification is part of the natural order. According to Duhem, the result of a physical experiment is not an observation of facts, but an interpretation of those facts that are transferred into the ideal, abstract, symbolic world created by theories the physicist believes to be correct.

It is above all the symbolic nature of physical laws that distinguishes them from the laws of common sense, which may be true or false. The laws of physics, on the other hand, expressed in mathematical form, are always symbolic, and a symbol can be neither correct nor erroneous.

In the course of its construction, a physical theory may select any route, provided it does not lead to logical contradiction. For example, Duhem asserts that a theory may completely ignore facts acquired experimentally. However, when the construction of the theory is complete, the group of mathematical propositions derived from these deductions must be compared with the group of experimental facts. This comparison, which is conducted by measurement, reveals whether or not the experimental facts are adequately reflected in the mathematical symbols. If no such correspondence between the conclusions of the theory and

the experimental facts is found, then the theory must be rejected, even if its construction is perfectly logical, since it contradicts observation, and is physically false. Only the conclusions of a theory are seen as the reflection of reality.

The moment an old theory has to give way to a more promising, new theory is not determined by logic. This moment is determined by common sense, and therefore, according to Duhem, it is very important for the physicist to completely retain common sense. When speaking of the emergence of new ideas in the mind of the scientist, or about his decision to reject an old theory and adopt a new one, Duhem wishes to emphasize that any creative process steps outside the boundaries of the logical, deductive development of scientific concepts and is determined by non-logical factors. All logical operations are carried out conventionally on the sole basis of agreement among scientists.

## THE PRINCIPLE OF CONTINUITY

The positivist tradition of the nineteenth century, which viewed the development of science as a continuous, cumulative process, was carried over into the twentieth century and continued into the 1950s. The history of science reveals more clearly than any other human activity the process of the accumulation of knowledge, and this factor became the objective basis for formulating the cumulative model of scientific development. The basic postulates of this theory are as follows:

Each advance in science is made only on the basis of previous achievements; new knowledge is always more complete and an improvement on previous knowledge. As it is more accurate and a better reflection of reality, the entire course of development up to this point can be seen as a preparation for the present situation. In this sense the history of science is progressive.

Only those elements of past scientific knowledge that correspond to current scientific theories have any significance. Ideas and principles that have not become part of current scientific knowledge are erroneous and, historically speaking, represent misunderstanding and deviations from the highway of scientific development.

The ideas of cumulativism were given their most complete and developed elaboration by Mach and Duhem. Mach saw the extension of an existing method of understanding to include a new group of facts as the main element in the thinking of the natural scientist. He termed this element the principle of continuity, the essence of which was to identify uniformity in natural phenomena and to present new facts in such a way as to bring them under known laws. A scientific discovery consists in presenting an unknown, inexplicable phenomenon or real fact as similar to something already known and obeying the same rule or law as the known phenomena. According to Mach, a scientific discovery is not a break in continuity, a revolution, but, on the contrary, is possible only when the natural scientist operates according to the principle of continuity.

## SCIENCE, LIKE NATURE, DOES NOT MAKE ABRUPT LEAPS (P. DUHEM)

For Mach, the problem of scientific discovery as a deviation from the continuous advance of scientific knowledge does not exist. Duhem sees a problem, but also its solution. All his arguments lead him to believe in the continuous, progressive development of science. The basic postulate upon which Duhem bases his arguments on this issue is that, although there can be no doubt that the history of science reveals the phenomenon of major leaps, revolutions, nonetheless they must be brought within continuity and included within some rational, historico-scientific reconstruction, in order to be comprehensible. It was in developing this idea that Duhem arrived at the 'rehabilitation' of the Middle Ages. He was the first historian of science to show, convincingly, and on the basis of facts, that medieval science has been of tremendous importance in shaping the natural science of the modern age. In his works, the Middle Ages ceased to be a dark age, a period in which no rational scientific thought existed. Duhem scrupulously traced the delicate intellectual threads linking the thinkers of various generations and ages. From this point of view, his research into the legacy of Leonardo da Vinci is particularly interesting.[3] The subtitle of this work speaks for itself: 'Those whom he read, and those who read him.' That is, Duhem studies Leonardo's predecessors and those who then used his ideas in their research.

In Duhem's opinion, the history of science is distorted by two prejudices: it is usually thought that scientific progress occurs as a result of sudden and unexpected discoveries; it is assumed that such progress is the fruit of the labour of genius, who has no predecessors. In fact, however, the history of science adheres rigorously to the law of continuity. Great discoveries are almost always the fruit of slow and complex preparatory work conducted throughout the centuries. Even those who are traditionally considered to be creative scientists, such as Galileo, Descartes, Newton, did not formulate theses that were unrelated to the teaching of their predecessors. An oversimplified account of history obliges us to admire them and see them as colossi having no roots in the past and incomprehensible in their isolation. However, more detailed investigations enable us to trace the long line of development that culminates with these geniuses. According to Duhem, science, like nature, does not make abrupt leaps.

Duhem refers to the concept of continuity and to the cumulative nature of scientific development in all his historical works, including the monumental multi-volume work entitled *Le système du monde*,[4] in which he follows the genesis and development of cosmogonic concepts from ancient times to Copernicus. Duhem believes that there is no absolute principle in the genesis of a scientific thesis. However far back into the past we trace the chain of thought that preceded and prepared the way for this thesis, we always encounter ideas that resulted in their turn from earlier ones. If this tracking of successive ideas comes to an end, it is not because we have discovered the first link, but because the chain has disappeared into the depths of history.

Writing about physical theory as such, Duhem states that it is not the product of a moment of creativity but, on the contrary, it is always the result of a slow and progressively developing evolutionary process.

Duhem shifts the emphasis in the interpretation of the cumulative nature of the history of science to the development of scientific ideas by not only separating science from metaphysics more clearly than his positivist predecessors, but also by separating it from social and

political history, common sense and from experience acquired in the course of practical activity. As for the problem of the relationship between science and metaphysics, Duhem relies on the assertion common to all positivists, namely that natural science does not have to strive to explain reality, that is, to reveal that which is concealed behind the phenomenon as if behind a smoke screen. When the natural scientist nonetheless attempts to offer an explanation, that is, when he engages in metaphysical argumentation, he is in no way furthering scientific thought. Metaphysical arguments on the essence of phenomena are not only unnecessary for the physicist, but even impede him, and if they serve to provide some external stimulus in achieving any significant results in science, it is purely fortuitous.

According to Duhem, in order to arrive at a physical explanation, it is essential to determine the nature of those elements making up material reality and not directly accessible to the human senses. This raises two questions: is there in fact such a thing as material reality apart from sensorial phenomena? If so, what is the nature of that reality? However, answering these questions is the task of metaphysics, not physics. Physics uses the experimental method, which deals only with sensorial phenomena, and which cannot discover anything outside of them. Duhem warns that to attribute an explanatory function to physical theory is to subordinate physics to metaphysics and to deprive physics of its autonomy.

Thus, Duhem arrives at the cumulative nature and continuity of the development of physical ideas by including within the history of natural science only the descriptive part of the theory. All the revolutionary elements are attributed to the history of metaphysics.

## INTERNALIST AND EXTERNALIST INTERPRETATIONS OF SCIENCE

If science is understood as the totality of scientific ideas, then the researcher who undertakes the study of science is faced with the discipline's dual nature. On the one hand, scientific ideas exist independently of the individual and of the historical period from which they emerge. They depend above all on the specific nature of the object of study (the natural world); scientific ideas follow and support one another thereby forming an integrated system of knowledge. On the other hand, one cannot ignore the fact that scientific ideas emerge in the mind of a given scientist and that their appearance is assisted or impeded by various events and factors which, at first glance, have no relationship whatsoever to the rigorously logical structure of scientific knowledge. Such factors may be related to social, cultural or political circumstances or they may relate directly to the life of the scientist.

Science can be divided into two categories: *objective* science, or the sum of ideas existing independently of the subject, and *personalized* science, which is linked to the scientist's activity of generating knowledge and its social, political and religious aspects.

This duality gave rise to the emergence of two methodological schools in the historiography of science in the mid-twentieth century:
  – internalism, whose proponents view the history of science as the history of scientific ideas whose development is governed by its own internal laws;

  – externalism, whose adherents view the history of scientific ideas as being determined by social context.

The mid-twentieth century was marked by stormy debates between these two schools, whose representatives met at international congresses and conferences. There were many publications in the form of journal articles, books and documents resulting from conferences and symposia.[5] Among the more active participants in these debates were A. Koyré, R. Hall and J. Agassi, who consistently supported internalism, and R. Merton, A. Crombie, G. Guerlac, E. Zilsel, J. Needham and S. Lilley, who defended the sociological interpretation of the history of science.

An analysis of these historians' comments on each other's views reveals that the supporters of the sociological interpretation of the history of science criticize their opponents for paying too little attention to the social aspects of the development of science.

Crombie claims that historians of the internalist school fail to study the motives and aims of science, the spread and application of scientific discoveries, etc. Guerlac accuses internalist historians of ignoring the link between the genesis and history of science and the rise of technology, although it is obvious that science is deeply indebted to practical activities and to the arts. Similarly, Needham is of the opinion that scientists are constantly coming up against practical problems and cannot avoid them.

For their part, the internalist historians see their opponents' weakness as lying in their failure to take into account the main content of science, that is, the development of scientific ideas, which takes place autonomously, according to Koyré.

Hall believes that the history of science is above all an intellectual history, and that it can in no way be explained by external factors. He particularly stresses the enormous difference between the two approaches to the study of the history of science and has spoken publicly more than once about the fundamental difference between them.

Yet, in a number of cases, if the debate continues (for example, the dispute between Merton and Hall on the origins of European science), it finally appears that there was nothing to argue about because this is not a case of two opposing and incompatible approaches, but of different subjects of research. It therefore should be possible for each side to carry on with its work without hindering the other.

## METHODOLOGICAL OPPONENTS SHARE THE SAME CONCEPT OF SOCIAL CONTEXT

Both internalists and externalists agree that the social context of science derives exclusively from the influence of external social factors (hence the name 'externalism') – economic, military, political, legal, etc. – on the development of scientific knowledge, which possesses its own 'internal' laws that determine the logical link between scientific concepts and between all the elements of the theoretical content of science. All researchers recognize that scientific knowledge, with its own internal logic, is relatively free from the influence of external social factors.

Social factors may accelerate or impede the development of scientific knowledge, change its direction, but they cannot exert direct influence on the internal logic and content of scientific ideas. This fact is generally recognized by both

schools: internalists, who reconstruct the logic of the development of scientific ideas, do not feel the need to study external social factors, while externalists, who conduct sociological research into the history of science, do not claim to analyse scientific knowledge per se. There exists, as it were, a 'division of labour' between science historians.

The concept of social context to be found in the works of both internalists and externalists as something accepted axiomatically and beyond all doubt presupposes the division of labour within society and an exchange of the results of the various types of activity. The scholar, the industrialist, the military commander, the administrator pursue their tasks, and specific social relationships exist between them and representatives of other spheres of activity. When the process of discovery or invention is complete, the scientist's task is to present his or her results in a practical form to be 'used' (in the broadest sense of the term) by other scientists and those involved in other types of activity (economics, politics, culture, etc.). This gives rise to a corresponding set of relationships. A scientist who has made a breakthrough in science is of interest and value to society as someone possessing certain information that can be transferred to others. The history of the discovery, that is, the scientist as an individual, is of no importance to society as regards the successful use of scientific results.

Similar demands are made on the person who receives the information. Qualities that might help decode the information and understand its genesis are not required. Such qualities might even hinder the successful exploitation of the newly obtained information. Indeed, if the scientist began to view each mathematical formula needed for his work in terms of the 'history' of this formula – its genesis or discovery – he would scarcely make any progress. The assimilation of the history of science in the form of the acquisition of ready-made information requiring no further verification is an essential element of all scientific work. This method of assimilating history is even more necessary and inevitable in material production, in everyday life, particularly when the results of scientific activity are being used.

In order to be able to make use of a television or refrigerator effectively, it is quite sufficient to be able to turn and press the appropriate buttons and switches. This equipment is made to be used by those who know nothing of its construction.

In order to make use of scientific discoveries in the manner described above, simple customary practices are quite sufficient, and personal qualities are irrelevant and can even be an impediment. Hence the wide possibilities of interchange: the same functions within society can ideally be performed by anyone, that is, the activity is constant and invariable. In the same way, in the history of science, scientific knowledge is impartial as regards the personality of the scientist, and also the social and cultural characteristics of the period in which this knowledge was brought to light. The most detailed and careful study of the social conditions accompanying the appearance of new scientific ideas will not lead the historian to the content and logic of scientific knowledge (externalism), while a scrupulous analysis of the internal logic of a scientific theory does not require any reference to the social context of scientific activity (internalism).

Activity to produce scientific knowledge in all its forms is separated from the result obtained. This interpretation of the social context of science would appear to be flawless. However, it has its limits.

## THE CONCEPT OF SOCIAL CONTEXT AND NATURAL SCIENTIFIC THOUGHT

The type of social context that predominates in the modern age (above all, with regard to material production), and is based on the division of labour and the exchange of the results of activity, also corresponds to certain features of theorization in classical natural science.

The dominant tendency in man's cognitive attitude towards nature is to view it as something alien and opposed to him. However, when cognition of the external world, existing independently of man as an object of study, assimilation and use, is understood only as a process directed outwardly, leading potentially into infinity and not restricted to man, then there is no longer any need to refer to social factors in order to explain the nature of scientific knowledge as such. The scalpel of natural science uncovers ever-deeper layers of nature, and it is possible to forget the fact that the scalpel itself (the technical equipment of science, its material resources, experimental apparatus, and the intellectual, logical capacities of the scientist) changes and improves. The internal content and structure of knowledge depends on the nature of the revealed layers, and not on the characteristics of the scalpel. The history of human relations – indeed the history of human society – is the prerequisite for the emergence of scientific knowledge. Yet, however intensely one may study social history, one will never draw any closer to understanding the structure and content of the knowledge in question, which reflects and reproduces a natural world existing objectively and independently of man.

Scientific knowledge cannot be conceived distinct from human society. It is created by men but, ideally, the closer it comes to absolute truth, the more it is cleansed and freed from all that is 'human', that is, subjective, transient, illogical or fortuitous. However, if the subject is deprived of all its distinguishing features, the subject as the 'cognizer' becomes invariable, always one and the same. The phenomenological fact that humankind is developing, and that the personal characteristics of the scientist change accordingly, should be taken into account only for the purpose of understanding what needs to be excluded from the process of cognition, the objective being to acquire truly objective scientific knowledge of the real world.

If we follow this line of thought, the social relations involved in the process of obtaining knowledge about the natural world lose their historical character. Communication among scientists does not depend on whether they belong to different periods or are contemporaries but occurs quasi-simultaneously. As it develops, science gradually frees itself from errors and mistakes linked to the subjective aspect of cognition, and carefully preserves the pieces of objective truth about the world that are not influenced by fortuitous historical events and factors.

The opposite point of view, which involves recognizing that the content of scientific knowledge is influenced by changing social factors is described as 'relativist' and justifies the arbitrary and chaotic nature of the history of scientific ideas. Ideally, the subject should be freed from all historical associations to avoid 'sullying' the logical flawlessness of objective scientific thought. In this sense, social aspects are entirely excluded from the development of scientific ideas.

This interpretation of the social context, applied axiomatically, represents the basis of both the internalist and externalist methodological trends in scientific historiography.

Scientific ideas develop according to their own laws. While social factors may accelerate or hinder their development as an external cause, they can in no way invade the content or the inner, logical structure of knowledge.

## THE MODUS OPERANDI OF SOCIAL DEMAND

Social demand is a powerful stimulus regulating scientific progress. Certain requirements emerge within society as a result of political, military and economic development, and these requirements can be satisfied by science. For example, the development of agriculture gives rise to a need for new types of fertilizers, and society places such an order with science. Society is quite unconcerned about the scientific methods used to satisfy this order. What matters is to obtain results of scientific research that can be exploited. The scientist, for his part, does not need to know how this order came to be formulated within society in order to carry out his work successfully. The priority is placed on social development.

In the case described above, social influences on science function as external forces to stimulate action, but they are not responsible for the laws governing this action: a crop failure obliging researchers to intensify their work in a particular area of chemistry does not determine the methods of scientific thinking. The internal nature of the external force is not important in terms of understanding the laws that govern the action generated. The result of scientific activity transmitted to society for exploitation also acts as a force that generates certain activity (for example, the use of fertilizers accelerates plant growth). However, the laws of this activity are not determined by the applied force (a plant may grow more quickly or more slowly, but it grows according to its own biological laws, which cannot be determined by new chemical fertilizers).

A correspondence can be demonstrated between social relationships and the logic of reasoning in contemporary natural science. In Newtonian mechanics, the nature of the forces causing motion is not known. These forces are characterized exclusively by the motion they cause. Kinetic laws of motion do not depend on the nature of the force that causes the motion. The motion of material bodies in this theory is reduced to the motion of material points. This means that kinetic laws of motion do not take into account the internal structure, the content of the moving bodies, nor those changes that take place in them as a result of the movement.

Scientific knowledge as a result concentrated within a mathematical point (the content of knowledge has a significance revealed only in its action on something else; as an operating force, it can be equated with a point) exerts a certain influence on processes within society, and similarly, the results of social development exert their influence on scientific progress.

## THE ESSENCE OF THE SEVENTEENTH-CENTURY SCIENTIFIC REVOLUTION

In the historiography of science in the mid-twentieth century, French science historian Alexandre Koyré appears in two guises. On the one hand, he was an energetic supporter of the internalists and believed in the autonomous nature of the development of scientific ideas. On the other hand, he was the main opponent of Duhem, disagreeing with the latter's concept of the continuous development of scientific knowledge. Duhem and Koyré differed fundamentally in their interpretation of the scientific revolution of the seventeenth century, and it was precisely this analysis of the seventeenth-century scientific revolution that honed their views of the development of the natural sciences. The mid-twentieth-century reassessment of the interpretation of the history of science based on cumulativism, continuity and progress was linked to a general crisis in positivist philosophy, which was then reflected in the historiography of science via the introduction of the concepts of discontinuous development, particularity, uniqueness, and revolutionary change. The first major shift in this direction came in the works of Koyré, who views the sixteenth and seventeenth centuries as an era of fundamental, revolutionary changes in the history of scientific thought. While studying this period, Koyré came to the conclusion that the European mind had achieved a profound intellectual revolution that modified the very foundations and structure of our thinking. This revolution occurred not only in science but also in philosophy.

Koyré opposed any attempt to minimize or even simply deny the originality and revolutionary nature of Galileo's thinking. Koyré showed that the seeming continuity in the development of medieval and modern physics – the continuity so persistently emphasized by Duhem – is merely an illusion. Koyré did not deny the existence of a tradition encompassing the works of medieval scholars and those of Giordano Bruno, Galileo, and Descartes, yet held that the conclusion reached by Duhem is mistaken. A well-prepared revolution is nonetheless a revolution.

Koyré describes the essence of this scientific revolution as follows: first and foremost, it led to the collapse of the cosmos, and also to the geometrization of space. Prior to this revolution, the cosmos had been seen as a perfect and ordered world in which the spatial structure embodied a hierarchy of values and degrees of perfection and the heavenly spheres 'rose above' a heavy and impenetrable earth. This was replaced with an infinite universe that did not incorporate any natural hierarchy and was held together only by identical laws. The second feature of this revolution, the geometrization of space, was closely bound up with the first. The Aristotelian concept of space as the differentiated totality of locations within space gave way to a Euclidean geometrical concept of space as a homogeneous and infinite extension.

All of this caused scientific thought to reject all considerations based on concepts of value, perfection, harmony, emotion and aims, and eventually led to the complete devaluation of God, to a complete rupture between the world of values and the world of facts. The most fundamental work by Koyré, where he developed and argued his concept of scientific revolution, is his *Etudes galiléennes* (1939).[6] For a long time thereafter, Koyré's research became the banner of the opponents of positivism in the history and philosophy of science.

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# 15

## SCIENCE AS THE ACTIVITY OF ACQUIRING KNOWLEDGE
### SECOND HALF OF THE TWENTIETH CENTURY

*Ludmila A. Markova*

### INTRODUCTION

In the first half of the twentieth century, the majority of researchers sought to isolate the content of scientific knowledge from social influence. Over recent decades, emphasis has been placed on the fact that knowledge does not exist independently but is shaped and determined by society. One reason for this shift is the attention focused on the process of acquiring knowledge. Knowledge is not a ready-made result independent of the process that produced it; rather, the means of acquiring knowledge can be found within knowledge itself.

During distinct periods in history, different methodologies have been used in the natural sciences. Similarly, methods of cognition vary according to the particularities of the social structure and culture. However, different methods presuppose diverse results, and the content of scientific knowledge changes from one epoch to another, since nothing is stable or constant. This content loses its objective character, and the question of truth loses its significance. If such a viewpoint is taken to its logical conclusion, it would appear that the structure and content of scientific knowledge merges with the act of acquiring it and that this activity is determined by society. One can therefore conclude that scientific knowledge is shaped by society, and its content in no way depends on the natural world as cognized via science. Moreover, it is supposed that the scheme of scientific theorizing is transferred directly from society to science. No allowance is made for the fact that the internal social content of science itself integrates and idealizes the ways of thinking of a given age, and only then do the norms of thought pass from science and philosophy and spread into society.

It is of course true that various methodologies, different types of thinking in various epochs, give rise to different forms of knowledge, but distinctive types of thinking realize or give substance to various aspects, leading to many possibilities within reality – that same natural reality that always remains the object of scientific study. The logical structure of a scientific theory is examined in light of its ability to compete with opposing points of views and its development into a new theory defended by other representatives of the scientific community.

In the mid-twentieth century, the external causal influences, which were determined by the way in which scientific activity functions within society, came to occupy the dominant position in the study of science as a social phenomenon. If certain phenomena or events did not fit in with the traditional sociological analysis, almost automatically they were declared inherently non-social. If we are not dealing with external determination, then we are not talking about social context.

Towards the end of the twentieth century, the picture changed considerably. External causal determination is now receding into the background, and attention is focusing on those personal relations that take shape in the course of acquiring new knowledge. But real difficulties arise. Can one call such relations 'social'? Should we reject the traditional concept of social context, and what consequences might such a rejection entail? Are we changing the very concept of social context too radically?

The source of all these difficulties in the interpretation of scientific knowledge was the prime role accorded to scientific revolution as the most significant, essential aspect in the development of science. This led to a revision of the cumulative model of the history of science, a model in which society and scientific knowledge develop in parallel, each in accordance with its own laws.

### SCIENTIFIC REVOLUTION AS THE DETERMINANT IN THE SUBSEQUENT DEVELOPMENT OF SCIENCE

It would be a mistake to think that historians who supported evolutionist views denied that revolutions occurred in the history of science. Phenomenologically, they recognized revolutionary situations, but assumed that they could be understood only by including them within the continuous flow of development and considering them part of the evolutionary process.

Usually, scientific revolutions were viewed as accelerated evolutionary development or as periods in the development of the natural sciences characterized by the fact that a particularly large number of major discoveries by

outstanding scientists were made in a fairly short period of time.

Another way of understanding scientific revolutions as part of the evolutionary process is to push the revolution itself further into the past during the analysis of the revolutionary situation by discovering an endless chain of predecessors preparing the way for the great scientists who, phenomenologically, then appear as the revolutionaries. In this case, revolution is understood as being not a transition from truth to truth, but from falsehood to truth, from pre-scientific concepts to scientific concepts, i.e. as an absolute principle.

In the second half of the twentieth century, the following important factor was brought to the fore in the interpretation of scientific revolutions: inter-revolutionary periods in the development of science, the study of which had seemed to yield such good results, are difficult to understand without a corresponding interpretation of scientific revolutions, since understanding the cumulative periods depends on this interpretation. It is presupposed that the new theory, which emerges in the course of a scientific revolution, differs radically from the old theory and that this means a transition to an essentially new type of activity. After the revolution, the development of science begins, as it were, from zero.

However, if a theory (or paradigm or research programme) emerges immediately in its integral, complete and perfected form as a model and instrument of activity in the post-revolutionary period, then during this period the scientist will not need to engage in any essential improvement of the new theory, since it is already perfected. It is only necessary to polish the details by successfully resolving questions emerging lawfully within the framework of the new theory. This is precisely the point of view expressed in the concept of T. Kuhn.[1]

In the inter-revolutionary periods, the scientist constantly perfects the superior qualities of the new theory, or slightly transforms that theory, adapting it to explain additional facts. In this case, the work of the scientist after the revolution is focused on the past, on a revolution that has already occurred, and the resulting theory. Science develops by constantly glancing backwards. This approach to scientific revolutions presupposes that all creativity, all effort to discover something new, is concentrated in revolutionary situations.

As for activity in the periods between revolutions, here activity consists exclusively in confirming and polishing existing knowledge and in using this ability as an instrument and a means of resolving problems whose significance is found within the framework of the new theory. The inevitable result is the excessively automated, algorithmic nature of scientific activity during the inter-revolutionary period.

## THE STRONG AND WEAK ASPECTS OF KUHN'S INTERPRETATION OF SCIENTIFIC REVOLUTIONS

Kuhn's position has both a strength and a weakness. On the one hand, he has identified an existing aspect of scientific development. Indeed, the new paradigm or theory is confirmed within the structure of scientific knowledge by subsequent work along the lines of that new theory (and its adaptation) in order to explain a range of new phenomena.

In the history of science, perhaps the most vivid illustration of this kind of development is the Ptolemaic theory, with its ever-increasing number of epicycles introduced to explain newly discovered facts, which render the structure of the theory excessively complex. As regards excessively formalized, virtually algorithmic activity along the lines of a given paradigm, this is a fact, and the strong point of Kuhn's theory is that he analysed such activity, linking it to a particular interpretation of scientific revolution. Everyday scientific research is not conducted in isolation, but is shaped by scientific revolution.

On the other hand, Kuhn's theory reveals a weakness: in directing his attention to precisely these aspects of scientific activity, he has unwittingly gone some way to returning us to the previous line of reasoning as regards the history of science, which argued that the development of science one way or another excludes moments of creativity, which are either moved to the periphery of science or even placed outside its boundaries. Kuhn's concept reveals a clear tendency to view scientific creativity as a vivid, exclusive and rare spark rigorously determining the subsequent development of science, in the course of which the previously acquired knowledge is substantiated in the form of an expanded and confirmed paradigm.

Here Kuhn opposes K. Popper, who places particular emphasis on the ongoing nature of scientific revolutions. Popper views the history of science as an unending chain of revolutions. The sooner any new theory can be proved false and overturned, the more scientific it is, and the more frequently this happens, the more successful is the development of science.[2]

Despite the fact that Kuhn's work undoubtedly contains different aspects of this idea, the basic postulate is nonetheless as follows: the development of science takes place primarily via the normal activity of scientists, whose main aim is to use the paradigm that emerged triumphant from the latest revolution in order to resolve current problems and thus confirm the validity of that paradigm and its advantages in relation to the previous paradigm.

Activity in the course of scientific revolutions is extraordinary, whereas the work of scientists in the post-revolutionary period is ordinary, normal, and it is precisely this work that enables us to distinguish science from other spheres of intellectual activity.

## THE PROGRAMME (PARADIGM) AS A PROJECT FOR FURTHER RESEARCH

Another possible interpretation of cumulative periods is one in which, when interpreting scientific theories, we proceed on the assumption that the theory that emerges in the course of a revolution is still incomplete. This point of view is developed with detailed consistency by I. Lakatos, particularly in his article 'Proofs and Refutations'.[3]

Unlike Kuhn, Lakatos does not believe that the scientific research programme that emerges in the course of a revolution is complete and fully formed. The continuity of scientific research in the post-revolutionary period emerges, in Lakatos' view, out of the lack of clarity in the initial research programme, which appears as a hazy indication for the future. The programme functions as a project for further research and as a project for its own further

development and final formulation. While the research programme is being perfected, Lakatos refers to its progressive development, which ends at some 'saturation point', after which regression sets in.

In the 1960s and 1970s, there were heated debates about the definition of a scientific revolution and its role in the history of science.[4] For all their differences, the ideas of Kuhn, Popper and Lakatos concerning scientific revolution had one thing in common: they were a reaction to the crisis of positivism and positivist concepts in the history of science.

## THE SCIENTIFIC COMMUNITY

The fact that Kuhn pointed to scientific revolutions as moments in the history of science when fundamentally new knowledge is forged inevitably evoked increased interest in the subject of scientific activity, be it relating to the individual scientist, the scientific community, or a research laboratory. The concept of the scientific community was of particular importance to Kuhn. It was the inclusion of this concept into his theory of the history of science that provoked sharp criticism from his opponents. He was accused of irrationalism on the grounds that, instead of providing a logical explanation as to why the scientific community rejects an old theory and espouses a new one, he had advanced social and psychological arguments.

Indeed, his work contains assertions to the effect that the transition to a new theory may be based only on faith in its future fruitfulness, or on some undefined aesthetic sense, that the main component of the convictions held by the scientific community at any given moment are personal and historical factors, apparently fortuitous and arbitrary elements.

The criticism launched against Kuhn over this issue is no accident. Here there is indeed the hidden danger of finding oneself beyond the boundaries of logic and rationality. The main difficulty confronting anyone who conducts research on the scientific community is that there emerges time and again an insurmountable demarcation line between the social relations within the scientific community and the content of scientific ideas.

As a rule, researchers fail to take into account the fact that very diverse forms of social relationships exist within the scientific community. These relationships may be those of superior and subordinate, of scholar and non-scholar, financier and manager, etc. The behaviour of scientists, the motivations behind their activity, the goals that guided their choice of profession and work, are the subject of detailed analysis.

It is important to note that this group of social relationships, although specific to the scientific community as one type of social structure, is nonetheless only very indirectly linked to the content of scientific ideas. Alongside relationships of this type, there is also the method of communication among scientists while discussing and resolving purely scientific problems. Here the scientist functions not as someone occupying a particular position in the hierarchy, nor as someone guided by non-scientific goals, but as someone representing a specific logical position in a given scientific dispute, as a supporter of some scientific theory or paradigm.

If one analyses a situation linked to the development of scientific ideas (for example, the situation of a scientific revolution), then in their debates with one another the scientists, as it were, personify various methods of logical interpretation. Here the test of whether or not a given scientist is expressing in his scientific argument what is indeed a logical position, and not subjective features of his own personality irrelevant to the development of science, is the possibility of replacing the scientist with a fictional character, as in the 'Dialogues' of Galileo, or the 'Proofs and Refutations' of Lakatos.

If there is no serious consideration of these distinctions, it will hardly be possible to arrive at a solution to the central problem that appears in the work of Kuhn and his supporters, namely how to avoid relativism, that is, changes in scientific knowledge when moving from one scientific community to another, from one set of social conditions to another.

## MICRO-SOCIOLOGICAL RESEARCH

The sociological science of the 1970s and 1980s absorbed many of Kuhn's ideas, and above all this meant rejecting rigorous demarcation lines between society and knowledge. Supporters of externalism, in particular R. Merton and his school, were of the opinion that the science historian and sociologist should not and cannot analyse scientific ideas. They recognized the need for a philosophy of science, whose object of study differs from that of sociology.

The new generation of sociologists, however, believes that only sociological methods can be used to study scientific knowledge in all its aspects and that sociology embraces all the issues of the philosophy and logic of science. These ideas are supported most consistently by representatives of micro-sociology. In their view, the products of scientific activity should not be seen as grasping and reproducing something that exists in the natural world. In fact they are forged, constructed and transformed in the laboratory out of whatever is at hand.

K. Knorr-Cetina, one of the most striking representatives of the concept of micro-sociology,[5] describes the relationship nature–scientific knowledge as external for science and unimportant in terms of understanding it, while social relations within the laboratory are internal for science and express its essence. In the opinion of Knorr-Cetina, theory as a product of scientific activity is a specific construction bearing the stamp of situational fortuity and the structure of interests involved in the process that gave birth to it.

The products of science cannot be adequately understood without analysing the process of their construction. This means that what happens in the process of their construction is relevant to the results obtained. It also means that the products of science should be seen as internally constructed in the process of production, independently of the question of their external structuring via verification of their correspondence to reality.

This initial postulate immediately excludes from Knorr-Cetina's discussion of science the cognitive relationship between man and reality. The activity of scientists in the laboratory, which for Knorr-Cetina is the embodiment of all science, forms a closed circle with no exit into the external world as an object of cognition. Scientific results, including empirical data, are described as being above all the result of

the production process, which includes chains of decisions and discussions and presuppose the need for selection. Each selection is made on the basis of the previous group of procedures for selection and, in its turn, becomes the basis for subsequent selections.

The complexity of the scientific constructions, which appear as a result of the various selections made by scientists in a particular laboratory, prompts us, argues Knorr-Cetina, to consider it highly unlikely that the products of scientific activity were obtained by the same method used in diverse circumstances. This means that it is highly unlikely that the process of production of the result could be repeated. This would become possible only if most of the procedures of selection were rigorously fixed or implemented in a similar fashion. Any novelty in science is seen by Knorr-Cetina as the result of social interaction and discussion. Innovation and its acceptance, according to Knorr-Cetina, are moments of temporary stabilization within the process of constructing knowledge, a process which is basically social. In contrast to Merton, Knorr-Cetina does not recognize that gnoseological issues have any right to exist outside the laboratory. In her opinion, her sociological analysis comprehensively covers all aspects of science, and is self-sufficient.

## 'MINIATURIZATION' IN RESEARCH INTO SCIENCE

The tendency on the part of sociology to absorb the subject matter of the philosophy, gnoseology and logic of science was strikingly apparent at the end of the twentieth century. Moreover, the consolidation of this tendency is linked to the 'miniaturization' of the object of research. As we have seen above in the case of Knorr-Cetina, the object of research is not relationships between, for example, science and the culture of a given epoch, its production, its social system, but relationships between the scientists themselves in a given laboratory. If it is a question of disputes and arguments, the researcher is interested not in fundamental scientific revolutions dealing with the problem of changing the manner of thinking and the picture of the world but in fairly mundane situations involving the solution of immediate questions in a given branch of science. The related discussions embrace the entire range of possible relations within the scientific community.

In his article 'The Political Anatomy of Controversy in the Sciences',[6] the American historian E. Mendelsohn attempts to substantiate the sociologization of scientific controversy. Here, in his opinion, it is not a question of social arbitrariness invading the sphere of purely scientific rationality in the study of contradictions and disputes, but a question of normal scientific activity and the procedure of selection, which is structured and organized by a fortuitous goal orientation. In a situation of dispute or conflict, the characteristics of the most ordinary behavioural procedures of scientific activity become more noticeable. In Mendelsohn's opinion, the authors of the reconstruction of many scientific debates reduce them to abstract content and make only occasional references to the personalities drawn into the disputes. For the most part, only the cognitive structures remain the focus of attention. In reality, however, the nature of the ending of the dispute, if closure in fact occurs, is shaped within the context of competing interests.

In the title of a collection of articles that includes the article by Mendelsohn, we find the concept of 'case studies' (*Scientific Controversies: Case Studies in the Resolution and Closure of Disputes in Science and Technology*). This concept is very important in understanding the nature of the development of science at the end of the twentieth century. By the 1970s, research in the form of case studies has become fairly widespread. In 1971, P. Forman published a long article entitled 'Weimar Culture, Causality and Quantum Theory',[7] which can be considered fairly typical of this kind of research. In 1979, M. Mulkay published the book *Science and the Sociology of Knowledge*,[8] in which he devoted considerable space to a description of case studies. During the 1980s and 1990s, case studies became a fairly common form of research.

## NEW FORMS OF RESEARCH INTO THE HISTORY OF SCIENCE AND FUTURE PROSPECTS

In case studies, the aim is to understand a past event not as something incorporated within a single line of development and possessing certain features in common with other events, but as something unique that could not be reproduced in different conditions. In the earlier type of historical work, scholars sought to study as many facts as possible, in order to discover something in common, and on this basis, to identify common laws of development. At present, the historian studies a fact as an occurrence and as the concurrence of many specific features of the development of science coming together at one point in order to distinguish it from others.

This raises the question of what is to become of the theoretical aspect of historical studies. Can we speak of the logical nature of a historical reconstruction if the result of the historian's work is the reconstruction of a unique event? How are we to understand the concept of the universal in history? Can we speak of the universal nature of historical research of this kind? Insofar as the individual and specific has always been understood to be the opposite of the logically universal, case studies were generally seen as empirical, and all the more so since, as a rule, case study authors themselves give little thought to the specifics of their own work. Case studies have spread somewhat spontaneously and not as the result of a deliberate methodological reorientation on the part of historians.

One cannot ignore the fact, however, that the historical reconstruction of a past event as something unique presupposes complex theoretical work of generalization in order to construct an integrated, three-dimensional event that brings together all its most diverse aspects. A mere photograph can in no way be a substitute for such a reconstruction: both logically and theoretically, this is no less complex a task than the universalization of historical facts and the identification of their common characteristics. The aim should be to elaborate the principles to be used to identify the universal in history via the study of unique, particular events.

Nonetheless, case studies should not be considered a completely novel form of historical reconstruction, for research of this kind has always existed. Here we are speaking of the predominance of a certain type of research and the fact that case studies have now come to the fore.

Research of the cumulative kind will also continue, for it reflects such important features of the development of science as the dependence of each new step forward on the previous level of development and the increasing volume of knowledge. It is simply that these features of the historical process are gradually losing their prime significance and are today slipping into second place as a result of changes in the type of theorization.

Let us look at some of the methodologically significant features of case studies.

First, such research concentrates not so much on a certain fact, some final result of scientific discovery, but rather on the event itself and, as far as possible, on its unique and integrated nature. Whether the researchers themselves realize this or not, these easily visualized events are clearly defined crossroads at which different lines of research into the history of science intersect, be it the analysis of the creative process, of social conditions, the correlation of society in general or the structure of scientific knowledge. Case studies are syntheses of the general and the particular, and the easily imaginable, concrete nature of the event under examination.

Second, it is very important for case studies to be a very delimited event; it is not, as a rule, the culture of some lengthy period in history or the culture of a large region. The objects of study are localized events, such as an individual text, a scientific dispute, conference materials or a scientific discovery by a particular team of scientists.

Third, it is particularly significant that case studies can be described as being a kind of a funnel drawing in both previous and subsequent events, although the object of study is contemporary science, is 'now', even if this 'now' relates chronologically to past ages.

Science historians have always wanted to know how individual creativity – the unique situation in which a new theory emerges – can be integrated within the general laws of the development of scientific knowledge. The previous chapter looked at how this question was resolved in cumulative concepts of the history of science. However, the use of general theoretical postulates always proves far from simple in practice.

The mid-twentieth-century crisis in the positivist methodology of science led to the formulation of the concept of 'system of thought' or the type of thinking of a given epoch (especially in the works of A. Koyré and T. Kuhn). Here the historian makes use of such concepts as particular and unique. Scientific thought is integrated into the context of culture in, for example, Antiquity, the Middle Ages or modern times. Moreover, the Middle Ages are no longer seen as a preparatory stage for modern times or as its pre-history or cause, but as an epoch having its own historical significance.

It is here that the single line of development breaks down. Different cultures are correlated to each other as coexisting at the same time, each illustrating its uniqueness. The fact that Shakespeare lived after Aeschylus gives him no advantages as regards the evaluation of his work. In science, it is more difficult to use this approach, since advance and progress in development, and its cumulative nature, are particularly evident. However, such a methodology of research is possible if science is viewed in a cultural context. Research into science of the kind conducted in case studies is a serious attempt to advance the study of science in precisely this direction.

## PHILOSOPHY AND RELIGION AND THEIR RELATION TO SCIENCE

In elaborating the concept of scientific revolution in the historiography of science (A. Koyré or T. Kuhn), emphasis was placed on the fact that, if the scientific revolution is indeed radical (such as the scientific revolutions of the seventeenth and twentieth centuries), then its basic meaning lies in the elaboration of the philosophical basis of science. The philosophy of the seventeenth century formulated that basis of thought which made scientific research possible: the corresponding concepts of cause, motion, time, space, etc. Philosophical thought constantly asks how science is possible and seeks to find grounds for this possibility. Science of itself ('normal science', to use Kuhn's terminology) does not deal with questions relating to its own justification. The natural scientist puts aside philosophical disputes regarding the founding principles of science and seeks solutions to his or her professional questions. The solution of strictly scientific questions is possible because the basic conditions of scientific activity as elaborated by philosophy are accepted without question. Thus philosophy provides the inner impulse to scientific development, and its principles are invisibly present in scientific ideas and theories, becoming an object of discussion only when they cease to function and when they become an obstacle along the path of further scientific development. And this is precisely what occurred in the early twentieth century. Science philosophized: major natural scientists immersed themselves in philosophical disputes over the nature of causality, time, space and the elemental.

Thus, science in its 'pure form' does not wish to be involved with philosophy, which is an impediment. Yet at the same time, scientific activity is only possible because philosophy has done preparatory work to elaborate the principles of scientific activity. However, scientific activity itself, as it develops, leads to a situation in which the initial philosophical principles cease to function and require renewal, and scientific research requires philosophical thought. In this way, science reveals its philosophical interior.

In those moments of scientific activity when the scientist puts philosophy aside, when philosophy impedes him, he often relies on religion or a religious attitude to the world. Religion serves as a support in such cases and helps him to orient himself in the world and justify his existence as a scientist. Religion does not provide an answer to the question of the truth or falsehood of given scientific theories seeking to explain the construction of the world. If science sees the world as something eternal and invariable, without having any interest in the question of its purpose, religion is interested in how the world was created, and for what purpose. This is the dividing line between religion and science. One might say that they are 'uninterested' in each other's questions.

However, the scientist is not simply uninterested in religion. He needs religion, and here one may note several points.

1) Philosophy questions the original principles, discussing them endlessly. Philosophy is a risky occupation that puts the mind in doubt. The scientist, however, cannot work on the basis of such uncertainty. He needs stability, and it is precisely religion that enables him to believe in eternal principles. For normal scientific research, such faith is essential.

2) The scientist treats the world as something pre-existing. The world is perceived by the scientist via his senses, and it is important for him to be sure that this is not an illusion or a mirage and that the world exists not only for him and his human perception. Religious truth lies in the creation of the world and the purpose of that creation. The world has been created, therefore it exists. This kind of religious belief in the existence of the world as a created phenomenon assists the scientist in his activity. The world exists not only for him, but also for God; that is, the world exists in reality.

3) Man cognizes the world with his intellect, and it is important for him that the world not be chaotic. He needs intuitive confidence in the harmony of the world. The world not only exists, but is also organized on the basis of laws. Such a cosmic religious faith facilitates the work of the scientist. Confidence in the existence of the world, its harmony and the stability of its founding principles is important for the very existence of science.

This, in general terms, is the attitude towards religion that predominated in the twentieth-century both among science historians, and natural scientists. The notion of the hostility between science and religion does not enjoy popularity, and this is true both as regards R. Merton and S. Jaki, who have undertaken particularly extensive research into the role of religion in the history of science.

**Protestantism and science in seventeenth-century England**

Merton analyses the historical situation in England in the seventeenth century, when the development of science was promoted both by industry and the new religious movement of Protestantism. In the preface to the second edition of his book,[9] Merton expresses a certain perplexity over the fact that it is precisely the relationship between science and religion, and not science and industry, that attracted the greatest attention on the part of the critics. Merton explains this as the result of the fact that his method of interpreting the relationship between science and religion differs considerably from the positivist explanation. The positivists (Merton refers in this regard to J. Draper and A. White) believed unquestioningly that this relationship could only be one of conflict and that a state of war between science and religion was inevitable.

Such conclusions were usually made on the basis of two kinds of facts. In the first place, there are historical facts that time and again confirm the hostility between science and religion, for example, the burning of Giordano Bruno, or openly hostile statements by religious leaders directed at science. The second type of facts involves the opposing nature of the dogmatic postulates of theological knowledge and the tendency of scientific research to bring everything into question. Merton does not deny either historical facts or the opposing nature of the theological and the scientific approach to the world. The possibility of contact between science and religion is based, according to Merton, on the nature of ethical norms. Protestantism unwittingly promoted the consolidation of science as a social institution despite its theology as a particular way of perceiving the world and despite the views of its leaders.

Protestantism was by no means the only possible social institution capable of assisting the emergence of modern science. It so happened that Protestantism was science's greatest, though not its only, support at that particular time and place. However, it might well have been that, in some other case, another social institution could have played the same role; it is a question of a particular combination of circumstances.

The social values characteristic of Protestantism meant that it approved of science by virtue of its deeply utilitarian orientation, concealed behind religious terminology and approved by religious authority. It validates those who have glorified themselves in 'good works' based on the desire to be useful to one's neighbour and to society as a whole. The utilitarian principle governed practical activity, and this brought Protestantism close to the rest of culture. Of particular importance in the social evaluation of science and technology was the Protestant tendency to praise the faculty of reason. Reason is worthy of praise as man, who is alone in possessing this quality, is made in the image of his maker. Reason is a means of bringing sensuousness and sinfulness under control. Reason enables men to praise God by perceiving the greatness of his creation. Protestantism as it were demonstrated the absence of any incompatibility between these two great values – reason and faith.

The main prerequisite of modern science, in Merton's view, is the widespread instinctive conviction in the existence of a 'natural order.' For Galileo and Newton, the ultimate criterion of the truth in science is experiment, but the very concept of experiment proves untenable without the original postulate that there is a natural order and that if one asks the appropriate questions, nature will supply the answers. This postulate is definitive and absolute, and expresses faith in the possibility of the existence of science as such. However, this kind of conviction, although it is an essential prerequisite of the emergence of modern science, cannot bring about scientific development. This requires a permanent interest in seeking to discover this natural order by not only rational but also empirical methods, that is, an active interest in the world together with a specifically empirical approach. In the form of Protestantism, religion created the conditions for the emergence of this interest. Protestantism insisted on active secular activity, with an emphasis on experience and intellect as the basis of action and faith.

## THE RATIONAL LINK BETWEEN CHRISTIANITY AND SCIENCE

In his analysis of the significance of religion for science, S. Jaki, a Benedictine monk and science historian, emphasizes in particular that Christianity is linked to belief in the individual, the rational, and the absolutely transcendental lawgiver or creator.[10] This is the Christian concept of God, which generated faith in the rationality of the world, in progress, and in the quantitative method, all of which are the component elements of scientific inquiry. In Jaki's thinking, a major role is played by the concept of 'natural theology', which he understands as following the path along which the human mind is confirmed in its knowledge of God. Science, historically and philosophically, provides a logical basis for understanding the work of God. Science deals with a basic issue: what kind of world is

needed if man is to be able to cognize it? Or, what should nature, including man, be like, if science is to be at all possible?

When Jaki writes of the need to give our utmost attention to the principles of science, he means that these principles cannot be understood outside the context of philosophy and religion. On its own, science is not able to answer the question of why science is possible. Closest to Jaki's concept is Duhem's theory that the origins of modern science derive from the Middle Ages. For Jaki, it is important to stress the fact that science did not begin with Galileo, and that 'medieval' means 'Christian.' In the Middle Ages it was considered beyond all doubt that the universe had been created freely and rationally, and it is only such a universe that is open to scientific investigation.

Delimiting fairly rigorously the sphere of the 'positable' in science (the scientist should not doubt the reality of the universe, its causality and rational organization, its creation by God), Jaki examines all scientific discoveries from the same viewpoint, that is, the extent to which they go beyond the positable within science. As a result, Jaki often finds himself in an ambiguous position: on the one hand, he praises science as being divinely blessed, while on the other, he is obliged to reject a whole series of scientific ideas and theories comprised quite organically within the structure of scientific knowledge, such as the idea of infinity, Darwin's theory, the uncertainty principle, the theory of the tunnelling of alpha particles, and the anthropy principle, among others.

The theological views of Jaki are extremely rationalized. He constantly emphasizes that the rational paths offered by science lead to God. Moreover, he believes that God gave man his intellectual faculties so that he might secure his conviction of the existence of God by purely rational means. Therefore, Jaki looks at all scientific achievements primarily in terms of the extent to which they testify to the existence of 'God the Creator'. The central question in science concerns the relationship of scientific knowledge to God, and it is difficult to say which line of thought dominates in Jaki: is it the scientist created by God in his own image and likeness, or is God, as imagined by Jaki, in the image and likeness of the scientist?

In Jaki's thinking, religion becomes so rationalized that the concept of faith virtually disappears. The existence of 'God the Creator' is not something one has faith in, but rather it is something to be proven logically with the aid of science.

## CONCLUSION

The main changes in the philosophy, sociology and history of science in the twentieth century were linked to the crisis in positivist philosophy in the mid-twentieth century. The very founding principles of knowledge about science, which until then had been accepted axiomatically, as not requiring discussion, appeared in a new light. In certain areas these principles were clarified and formulated more precisely, and certain features became even more convincing when seen from this new angle. Other features were reappraised and questioned, and some foundered, leading to a sense of disorientation and confusion.

During the period of crisis, many things came to be viewed differently following a study of the theoretical and social aspects of scientific revolution, and the dominant object of study – the consistency and continuity of scientific development – appeared in a different perspective. Indeed, never had the progressive and cumulative nature of scientific development been subjected to such detailed discussion and analysis. There are few researchers who would venture to deny that modern science possesses these qualities. However, certain problems arise. For example, how is the continuity of science to be combined with the inevitability of scientific revolutions, when scientific knowledge undergoes a radical change? How is the transition from pre-revolutionary to post-revolutionary knowledge achieved? Can this transition be explained rationally, or is the single thread of scientific development in fact divided, each period in the history of science having its piece, in no way connected to the others? How are we then to explain the vectorial nature of the development of scientific knowledge?

Or let us take the question of the social context of science. One can scarcely doubt (and virtually no one does) the massive influence that external social factors have on the development of scientific ideas. However, can it be viewed as decisive during periods of scientific revolutions? Can the process of the emergence of a new scientific theory be determined by external economic, political, military or other factors? The answer given by most researchers, whether directly or indirectly, is 'no.' The very idea that we can ignore external social factors when analysing scientific revolutions and such factors as the appearance of anomalies in theoretical knowledge, or the emergence of a competing theory and its conflict with the old one, force us to respond negatively to this question.

Thus the previous concept of the basic mechanisms of the social influences operating during scientific revolutions no longer holds, and this obliges us to look at them from a new angle, to ponder the specific features of their operation within society and to define the boundaries of their effectiveness in the development of scientific knowledge. Moreover, a clearer and, one might also say, more profound interpretation of external social factors in science inevitably follows from any comparison with other forms of the social context within science. These factors have become a direct object of investigation together with scientific revolutions, leading to particular interest in the study of the scientific community engaged in producing new knowledge and the appearance of a new type of research known as case studies.

To the extent that, in the twentieth century, science is one of the most important components of the social, public and cultural life of all the regions of the world, the problems addressed above are being actively discussed by scholars around the world. However, it should also be remembered that science has its own specific features in the context of, for example, Oriental cultures, where philosophy, religion and social order have shaped the traditional development of natural science through the centuries. Moreover, these traditions live on and now require special analysis. In this connection, we must mention the British science historian J. Needham, who devoted many years to studying science in China.

In Eastern Europe and the Soviet Union in the twentieth century, the social, political and ideological conditions were such that direct contact with Western scientists was very difficult. Soviet research into science continued energetically, but to a large extent it functioned in isolation, and contacts

with Western colleagues were often of a purely official nature. Both the issues and the lines of research were often determined by various ideological considerations. Soviet scholars were unable to join the Western confraternity of sociologists, philosophers and historians of science. Their work should now become a special object of study. Let it suffice to say that in the Soviet Union there was a strong school of philosophical interpretation of science and its history as represented by the works of V. S. Bibler, P. P. Gaidenko, and M. K. Mamardashvili. Research into the internal logic and system of science was undertaken by V. N. Sadovsky, V. A. Smirnov and others, while the methodology of science and its history were explored by V. A. Lektorsky, S. R. Mikulinsky, V. S. Styopin, and many others.

The tendency to identify unique features of science, which appeared towards the end of the twentieth century, obliges us to avoid seeking to standardize the enormous and diverse worldwide range of approaches to understanding science as a social and cultural phenomenon.

The improvement of methods of communication among scholars, thanks to technological developments and the computerization of all spheres of life, is leading to the creation of larger teams of scholars from different countries and continents. The corresponding terminology has also appeared: now we speak not of schools, which are usually associated with particular universities, institutes or laboratories, but about worldwide colleges, problem groups, scientific communities. Scholars are united by a given issue and common research interests. Science is being internationalized.

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# MEDICINE AND PUBLIC HEALTH

*Jean-Charles Sournia*

The spectacular progress achieved during the twentieth century in many branches of medicine, in terms of diagnostic and therapeutic tools and pharmaceutical and surgical strategies, should not lead us to underestimate the extent to which attitudes towards the health of nations have also changed. The concepts of public health and social medicine developed during the first half of the nineteenth century first in Britain, and subsequently in France, but it took a long time for these ideas to be put into practice. None of the doctrines devised ever led to the immediate establishment of a system to protect the population from various health risks. The few rather partial measures taken focused mainly on the cities (since the countryside was thought to be a healthy place) and on collective groups such as the army (in France, in 1852).

Despite the findings of Pasteur and Koch, it was only after the turn of the century that European governments actually recognized that infectious diseases were contagious. The inauguration of the Office International d'Hygiène Publique (OIHP) in Paris in 1908 was a long-awaited event that took fifty years to materialize. This meant, however, that it was at last possible to set up international cooperation between the various gradually developing national health services.

We propose to outline in the present article the complex history of public health in the world (except Asia). Technical developments in the field of medicine will be alluded to as briefly as possible, since their story has been told elsewhere.

## 1914–1940: A PERIOD OF CONTINUATION

### The effects of the First World War

Many countries took part in the global conflict of 1914–18, which split the world into two. The spirit of international solidarity did not disappear completely, however, since the countries engaged in the hostilities continued to submit public health reports to the OIHP throughout the war.

As commonly occurs in times of war, epidemics were rife during this period, for several reasons. First, there were the troops moving from one place to another: the Allied armies received reinforcements from North Africa, sub-Saharan Africa, India, Indochina, Canada and Australia, and American troops were also sent to France. Secondly, whole populations migrated from northern to southern Europe and from east to west. And lastly, in times of war, administrative structures are relaxed, and the regulations relating to matters of health are not applied strictly. For practical reasons, it is difficult for the population to apply the basic rules of hygiene. This explains how typhoid fever devastated the Austro-Hungarian army and spread throughout the Balkans. The French and German contingents were better vaccinated. The Eastern European countries were ravaged by typhus until the 1920s, just as they had been one century earlier at the time of the Napoleonic invasion. They were also swept by epidemics of typhoid, cholera, dysentery and malaria.

No doubt due to the arrival of the North American troops in France, a wave of what the French called 'Spanish flu' began to work its way through Western Europe at the end of 1917. It spread among the armies and all levels of civilian society, probably causing up to a million deaths. Those who caught the disease either died of pleuro-pulmonary complications or continued to suffer from secondary purulent pleurisy up to the end of the 1930s. When the troops were demobilized at the 1919 Armistice, the influenza was transported to the southern shores of the Mediterranean. The virus is now known to have been related to the porcine influenza virus, which is still endemic in the Western world.

The state of war made it possible for public authorities to take increasingly firm public health measures. The efforts made by administrations in Britain, Germany and France during the previous century to promote public health had come up against some resistance from those who claimed that it was contrary to individual human freedom and the right to self-determination. These arguments tended to seem less convincing under wartime conditions. The public health laws voted in France in 1902 and 1905 were vigorously enforced, and even the most recalcitrant town councils were eventually obliged to open a public health office. The state asserted its authority at the end of the war both in Britain,

where a Ministry of Health was set up, and in France, where an independent Under-Secretary of State was appointed in 1920.

In the various countries, a multitude of private charitable organizations were created for the benefit of wounded soldiers, civilian populations, refugees from places badly damaged by the war, women who had been working in the factories, orphans in distress and other groups. The Red Cross Societies were busier than ever before.

The amount of mutual aid from which the Allies benefited made spectacular strides. In the Balkan countries, the work of the expeditionary forces' medical services consisted largely of helping the civilian populations suffering from epidemics and food shortages: these countries had become only recently independent and were too impoverished to be able to quickly set up the requisite administrative and medical structures on their own.

The United States, for its part, was helping the invaded countries. On the French front, the United States financed the equipping of ambulances, one of which was manned by the Nobel Prize winner Alexis Carrel, who developed new methods of treating infected war wounds. As soon as the hostilities came to an end, the Rockefeller Foundation distinguished itself in Europe in the campaign against tuberculosis and participated actively in informing the public about hygiene.

### Fighting infectious disease

Since the relative success of the battle against infection within the contending armies was quite encouraging, the early measures designed to protect the civilian population before the conflict were further extended during and after the war. As previously occurred in France in 1902, lists of diseases that had to be declared were disseminated in several countries, and medical inspectors were made responsible for collating the numbers declared, so that the Western nations were gradually able to publish coherent health statistics. Systems of public health administration began to be set up under the aegis of specialized ministries.

These measures were more drastic in France than in most other countries however, since the entire French population was vaccinated against smallpox. Most other countries refused to make vaccination compulsory for the sake of individual freedom of choice, but nevertheless used persuasive methods to ensure that vaccination was widely adopted or made it mandatory for some collective groups, such as the armed forces and school systems.

Vaccines of several other types were also used at that time: the tetanus vaccine was not much in vogue, but vaccines of two other kinds, which were widely used in both the more backward and the more modern parts of the world, were to have decisive effects on public health. The first of these was the anti-typhoid and paratyphoid vaccine. It was widely recognized by that time that these diseases were transmitted by drinking water, and vast public campaigns were launched to encourage people to be vaccinated, but something also had to be done to improve the quality of the water supply. City water supplies began to be chlorinated (this method had actually been tested during the war by the city of Verdun). The main improvement consisted, however, of extending the water supply networks. Despite the outstanding examples of innovations made in Britain and

Germany beginning in the nineteenth century, many towns elsewhere were not equipped with properly organized general water supply systems. The town councils were providing workers' tenement blocks with only outdoor drinking fountains.

As the number of public pipelines laid down by either public or private agencies increased, the bacteriological quality of the water was improved by the water companies responsible, under the control of the administrations. The number of uninspected privately owned wells decreased.

In addition to the progress achieved in the distribution of healthy drinking water, the problem of sewage disposal arose. Many improvements needed to be made, and too many built-up areas were using their own neighbouring rivers as sewers. In this respect, the situation took longer to improve, and in 1940, many European and American cities were still not properly equipped: this was so in the case of Lyon, the second-largest French city, for example, which is situated on the banks of two large waterways with fast, regular rates of flow.

The second vaccine to have decisive effects, particularly on the infant mortality and morbidity rates, was the diphtheria vaccine. This type of vaccination was widely adopted by families, even in the absence of any legal obligation, and the incidence of this disease decreased conspicuously in places where children gathered.

The decline of this disease went hand in hand with a sharp increase in the numbers of public and private institutions devoted to protecting children. This trend reflected a change in the public's attitude, which began at the end of the previous century and showed an upsurge after the First World War. The war had led to the expansion of the industrial suburbs, along with the attendant insalubrious, overcrowded housing conditions; despite the increasing numbers of nursery schools and dispensaries and the intense activity of charitable organizations, new-born infants and young children were particularly hard hit by the food shortage that occurred in Germany in the 1920s and by the famine that ravaged the Soviet Union.

Much attention was also beginning to be paid to maternal health care. Contrary to the general rule, according to which women gave birth in their own homes, many maternity homes were built at that time in the form of either small private establishments or public hospital wards. Childbirth was becoming safer in the hands of experienced medical staff. Since the introduction of sterile conditions and antiseptics, epidemics of puerperal fever were no longer to be feared. Maternity homes were opened for women in need and unmarried mothers, and the improved level of family hygiene made it possible for bottle-feeding to be widely adopted. Despite the intensive propaganda circulating in favour of breast-feeding, newly delivered mothers were not always able to provide their babies with their full nutritional requirements. Clean bottles and high-quality manufactured milk substitutes would soon be taken for granted. During the period between the two wars, infants no longer died of malnutrition in most European countries, and the profession of wet nurses and its promoting organizations were phased out. Many efforts were made to protect women and children. In the framework of compulsory school attendance and the development of schools, school health departments were created.

The hardships of the war increased the incidence of tuberculosis. Many people caught the disease, with a mainly

pulmonary focus, and in the towns, people at all levels of society were struck. It is generally held that the epidemic reached its peak in Britain, followed by France and Germany in the nineteenth and early twentieth centuries, and that tuberculosis was spontaneously in decline by mid-century. Whether or not that is an accurate picture, contagion was still running rife at that time in all European and North American countries.

A vast international campaign was launched to promote the elementary rules of hygiene as a means of preventing contagion. The populations were informed via many channels: at school, by means of bills posted on walls and billboards on public transport vehicles, and in public talks given by itinerant charitable associations.

In some countries, the strategy adopted was vaccination for all with the Calmette-Guérin bacillus (BCG), while others were more wary or refused to follow suit on the legitimate grounds that vaccination did not afford absolute protection. The scientific debate on the issue became even more heated when several children died in the 1930 Lübeck accident, due to the use of an improperly prepared vaccine. Open-air sanatoriums and preventoriums were instituted for children from insalubrious areas and those already showing alarming signs of primary infection. X-ray methods were by then available for detecting pulmonary lesions at an early stage, and intensive screening campaigns were organized on the theme 'early screening is the key to a quick cure'. Some sectors of the population were made to undergo systematic lung X-ray examinations, and specially equipped vans tested people at places of work and schools. This was the first time in the history of public health that medical testing had been carried out on groups of people, regardless of their state of health.

Lastly, for the sake of those whose expectoration was found to contain tubercular bacilli, special establishments were opened in places where the fresh air was reputed to favour recovery, at high or medium altitudes, by the sea or in pine forests, so as to reduce the risk of contagion. Patients with tuberculosis were therefore moved to these sanatoriums from their usual surroundings so that they would not contaminate other people; they were treated with restorative drugs, by inducing intra- or extra-pleural pneumothorax, and by performing thoracoplasty. Such medical and surgical methods were designed to give the affected lung a rest.

**Health care and social welfare**

The principle on which the above-mentioned techniques were based was not new, since it had been invented by Forlanini before the First World War. The lack of appropriate therapeutic innovations was actually one of the hallmarks of this period in the history of medicine.

Surgeons certainly had plenty of scope for showing their dexterity and technical know-how, especially when operating on the limbs and the abdomen, thanks to asepsis and anaesthesia. They were less adventurous when it came to performing intra-thoracic and brain surgery, however. Physicians, on the other hand, recorded relatively little progress.

The one outstanding event was Roentgen's 1899 discovery of X-rays, which made possible spectacular strides in the field of medical diagnosis. Never has any scientific discovery spread so quickly throughout the world without causing any controversies or squabbling among various schools of thought, but consistently arousing admiration and enthusiasm for its many possible applications. It was henceforth possible to explore all the organs in the body from the outside.

In the field of chemistry, new and never-imagined vitamins and hormones were discovered, which led to the identification of human diseases resulting from the insufficiency or excess of these indispensable substances. It was not until the end of the 1930s, however, that some original therapeutic molecules were discovered, thanks to the fact that the main aim of the research workers at that time was to find means of fighting infectious diseases: the first sulfonamides capable of destroying dangerous germs in humans were manufactured in Germany and France. At the same time, A. Fleming had discovered that penicillin, which is produced by a living organism, was capable of preventing other organisms from developing; some time went by, however, before this discovery reached the practical application stage.

Steps were taken by surgeons and mainly private companies to set up medical establishments, maternity homes and surgical clinics, such as the cancer clinics at which famous surgeons received visitors and treated patients from all over the world. Only the poor frequented the public hospitals: a sharp distinction was also made in every country between those who could be tended in their own homes and the others. Poor people went to public establishments, while the more better off tended to seek treatment at private ones, which tended to be more comfortable and better equipped.

To combat this segregative tendency, efforts were made in some countries to develop various social welfare systems to protect the least privileged members of society. The first steps on these lines were taken by Bismarck in Imperial Germany back in the 1880s, when a sickness insurance fund was created for industrial workers, along with special occupational accident risk coverage. Although these regulations involved only some categories of workers, they were subsequently adopted in many European countries and gradually extended in the 1930s to include other categories of beneficiaries, whereas the United States was quite opposed to social welfare of this kind. The period also witnessed the opening of dispensaries, where needy citizens could be screened or treated for tuberculosis, venereal disease, etc.

The Soviet Union adopted a different strategy not involving health insurance. Based on an ambitious programme, free health care was dispensed to all the populations within the Union, including the inhabitants of the destitute Central Asian republics. Other aspects dealt with in the USSR included hygiene campaigns, various occupational health initiatives and efforts to eradicate tuberculosis.

Another form of family aid came into being. Since many young men had died during the war – in France, one and a half million men of procreative age had been killed – some governments, starting with France, followed by Italy and Germany, implemented policies encouraging childbirth. Families with several children were provided with financial aid in the form of family allowances. This system, which has meanwhile been adopted and maintained in many countries in the world, is designed to incite people to have larger families. Whether this aim is always achieved still remains

to be proved, but in any case, these cash allowances are always welcome in needy households.

## International efforts

The previous century showed how effective international cooperation could be in combating severe contagious diseases. The global conflict did not lessen the truth of this statement. The countries involved in the First World War were not affected by any of the three terrible diseases with which the nineteenth century had been so obsessed: the plague, cholera and yellow fever.

The first few decades of the twentieth century were marked, however, by a plague epidemic, which did not spread beyond Eastern Asia. Several medical teams fighting the disease met up in Manchuria. Europe was hardly affected at all by the plague epidemic, apart from twenty or so isolated cases contained within a Paris suburb, which came to be known as 'the rag-trade epidemic', and never spread elsewhere. On the other hand, cholera was still endemic in the Indian subcontinent.

In medical circles, the terms 'hygiene' and 'public health' were considered synonymous. Ensuring the health of the population meant abolishing epidemic diseases. Future doctors had to be trained in this new discipline, and two different solutions were adopted for this purpose. In Italy, Germany and France, university chairs were created for the study of hygiene at the medical faculties. The Anglo-Saxon countries opted rather for setting up specialized institutions: the Johns Hopkins School of Hygiene was founded in Baltimore in 1918, and the London School of Hygiene and Tropical Medicine in 1929.

The war also proved the solidity of the colonial empires founded by Britain, France, Italy, Belgium, Portugal and the Netherlands (the German dependencies were redistributed when the peace treaty was signed). The colonial medical services were not only good observers of the state of health of the countries they occupied (which contributed to promoting the worldwide communication of medical information); they also took an extremely active part in improving the health of the inhabitants of these rather backward countries. They made use of all the preventive measures at their disposal: vaccination and public information campaigns, reducing the incidence of parasitoses and improving hygiene in towns and encampments.

At the instigation of the countries concerned, schools of medicine were often founded in Africa, India and the Far East, thereby resulting in fully trained doctors or health officers who were in close touch with the native population and familiar with the traditional local customs.

It was largely thanks to the colonial regimes that several dozen institutes were created throughout the world for the purpose of carrying out research on the identification and prevention of bacterial and parasitic diseases. In Latin America, Africa, the Far East, and the Soviet Union, some of these institutes were dignified with the name Pasteur and some of them were actually placed under the aegis of the Institut Pasteur in Paris.

The OIHP continued to collect and disseminate epidemiological information through the two world wars up to 1946. The creation of the League of Nations, despite its 'Health Organization', did not detract from the usefulness of the OIHP. Not all countries joined the League of Nations, and the Soviet Union took part in its activities only episodically. After gaining membership with some difficulty, Germany left in 1933, and Italy was practically expelled after occupying Ethiopia, the only African member country. As for the United States, which failed to follow President Woodrow Wilson's principles, it never became a member at all. It continued its membership in the OIHP, and continued to run the Pan-American Health Office in Washington, which it controlled.

The League of Nations then began to undertake missions on a larger scale than those of the OIHP. The original 'Epidemics Commission' became the 'Health Organization', which gradually acquired international responsibilities. It was decided that the regional offices in Constantinople and Tehran and the Danube Commission, which had served before the war as lookout posts for the Eastern Mediterranean region, were henceforth to be managed by their respective governments, but France remained in charge of the Tangier office. The maritime and quarantine health council in Alexandria continued to be responsible for the medical supervision of pilgrims travelling to Mecca.

The League of Nations set up malaria and cancer commissions and dealt with matters such as nutrition and harmonizing pharmacopoeia. Since the fear of epidemics did not disappear, it worked at improving the medical regulations relating to sea transport, air transport, quarantine and the bills of health required for access to harbours, the eradication of rats from shipping vessels, etc. The League of Nations also cooperated with the recently created International Labour Office (ILO) on matters concerning the prevention of occupational accidents and disease. Both organizations had their headquarters in Geneva.

The Red Cross Societies had played an important role during the war, aiding both the armed forces and the civilian populations. The five Societies set up in the main Allied countries held a meeting at which it was decided to set up a permanent organization, the League of Red Cross Societies, also based in Geneva. In some countries, the Red Cross had a monopoly on blood transfusion, a practice that had undergone some technical improvements and was still being widely used after developing during the war. It continued to combat tuberculosis, cancer, and alcoholism and to work for the protection of children (Plate 76).

In addition to all these already long-established organizations, innumerable private associations were springing up, resulting in increasingly international contacts and exchanges of information and researchers. It would be impossible to list them all, but those that did the most for the health of the populations were no doubt those specialized in the study of tuberculosis (already underway for several decades) and cancer.

Two international health conferences organized in Paris in 1926 and 1938 by the governments involved led to some interesting comparisons on the state of health of the countries participating, but the atmosphere was not the same on both occasions. In 1926, the League of Nations was setting up its structures, but in 1938, political divergences made concrete achievements impossible. Although the 12-year interval between the two conferences was much shorter than that which had elapsed between similar events during the previous century, there was definitely a loss of interest due to the existence of permanent organizations such as the OIHP in Paris, the League of Nations in Geneva

and the Pan-American Organization in Washington. The secretariats of the organizations were able to draw up an approximate picture of the world health situation on their own, and their efficiency was ensured by the permanent participation of the governments.

## 1940–1950: A DIFFICULT PERIOD FOR THE WORLD

### The ailments of war

The League of Nations turned out to be incapable of carrying out the mission it had been set in 1919: to settle any dissension between nations, so as to prevent the situation from degenerating into war. The conflict triggered in Europe in 1939, after the preliminary rounds in Ethiopia and Spain, degenerated into global warfare in 1941. As always in the history of humanity, the war degraded the state of health of millions of people, and epidemics raged in many places. The most original feature of this war was that the losses incurred among non-combatant civilian populations were similar to those of the armed forces.

Once again, the movements of the troops and the shifting populations resulted in a typhus epidemic in Eastern Europe. This disease was endemic in the German prison camps, whose occupants were crowded together and undernourished and where the basic rules of hygiene were neglected.

Armies travelling around the globe were exposed to very different and unfamiliar climatic and environmental conditions, and many soldiers contracted malaria. The Australian units in Romania and the Balkans caught the disease, which was lethal in many cases. The Germans in Tripoli were less severely afflicted by it than the Americans on the Pacific Islands. In the Near East, the passage of troops between Asia and the North African and European battlefields, along with the relaxation of public health supervision, led to a cholera epidemic, which persisted in Egypt during the 1940s, even after the end of the war (Plate 77).

Rationing and food restrictions favoured the spread of tuberculosis. Those living in closed communities, such as camps, ghettos, psychiatric asylums, and other institutions, suffered from famine. The death rate among tubercular patients at sanatoriums was strikingly high. As usual, the main victims were young infants and the elderly. Among the civilian population and prison camp inmates, there was a recurrence of hormonal and vitamin deficiency diseases that had been eradicated in Europe for several decades such as nutritional oedema, rickets, and amenorrhoea.

Just as the First World War had ended in a huge influenza epidemic, the Second World War culminated in the proliferation of the poliomyelitis virus, although its victims were less numerous. These circumstances led to improved rehabilitation techniques and equipment (for treating functional respiratory deficits, for example), and the efficacious Salk (Plate 78) and Sabin vaccines were soon developed (Table 2). A sizeable epidemic of viral hepatitis also broke out.

In occupied Europe, the military health services and public health administrations were still working with pre-war techniques, whereas Anglo-Saxon industrialists and research scientists were constantly perfecting their therapeutic methods. This meant that their soldiers benefited quite early on from penicillin, which was invented before the war by A. Fleming and manufactured in the United States. The American and British medical specialists developed closed circuit anaesthesia, a whole range of surgical instruments, and methods of treating limb artery wounds and packing and transporting blood supplies for transfusion. The civilian population in Europe had to wait a few years before they were able to take advantage of these innovations.

The benefits of the industrial research and development carried out during this period were to be felt for several years. In response to the worldwide poliomyelitis epidemic, new emergency techniques, especially respiratory ones, and new types of orthopaedic aids and replacements were developed during the immediate post-war period. When biocompatible metallic and synthetic materials were made available, it became possible to implant vascular and articular endoprostheses.

The advent of peace led to the discovery that some quite unprecedented forms of human cruelty had been perpetrated in several of the countries involved in the war, where millions of people had died in concentration and extermination camps. Nazi and Japanese physicians had been performing surgical experiments on healthy people without any scientific justification and with mostly fatal results. These atrocities gave rise in international law to new concepts such as 'war crimes' and 'crimes against humanity'.

*Table 2* **Cases of poliomyelitis morbidity in Europe and Oceania** *(Annual Mean)*

|  | 1941–1945 | 1946–1950 | 1951–1955 | 1956–1960 | 1961–1965 | 1966–1970 | 1971–1975 |
|---|---|---|---|---|---|---|---|
| Austria | 334 | 1,191 | 607 | 644 | 70 | 1 | 1 |
| Belgium | 225 | 164 | 475 | 395 | 79 | 3 | 1 |
| Denmark | 984 | 703 | 1,614 | 72 | 77 | 1 | 0 |
| Finland | 302 | 227 | 342 | 306 | 7 | 0 | 0 |
| Ireland | 1,750 | 2,527 | 3,342 | 4,796 | 2,121 | 93 | 11 |
| Norway | 743 | 574 | 981 | 140 | 36 | 8 | 5 |
| Sweden | 1,766 | 1,432 | 1,526 | 213 | 28 | 1 | 1 |
| England and Wales | 824 | 5,843 | 4,381 | 2,706 | 317 | 24 | 2 |
| Australia | 336 | 1,201 | 2,187 | 331 | 151 | 1 | 2 |
| New Zealand | 54 | 313 | 413 | 225 | 44 | 1 | 0 |

*Source:* M. Paccaud, 1979, *Poliomyelitis Morbidity in Europe and Oceania.*

**Convalescence**

Governments everywhere, whether or not they had been involved in the war and whether or not they had been occupied by foreign powers, had taken various authoritarian measures during the conflict to safeguard their nations' health, and when peace was restored, they did not relinquish their efforts. However, a change of attitude had occurred since the pre-war period. The population's health was no longer thought of as the sum of all the individual inhabitants' health, for which each one was responsible; by now, it had become a matter for the state. To provide for the welfare of all, from both the medical and social points of view, was henceforth a state obligation and a citizen's right. On the other hand, the fact that the civilian populations had suffered as badly from bombing and deprivation as the members of the armed forces gave rise everywhere to a spirit of national solidarity favourable to the concept of collective health. Accordingly, the structures responsible for managing the health of the population were renovated at this time in many countries and gained a new lease of life. The reconstruction of ruined towns, equipment and collective establishments required firm administrative control, and the inhabitants of the Western world readily recognized a degree of authority they might not have tolerated one century earlier.

The British Government had drawn up a vast social security project during the war, which was almost completely implemented in peacetime and taken as a model by the governments of France and other countries. Nearly all health care services became available free of charge to all social and professional classes, and sick people were not to be allowed to go without treatment because they could not afford it. A legally binding pact of solidarity brought together rich and poor, sick and healthy, young and old.

Each country devised its own system of financial support, administration, and management for dealing with social protection. A single body dependent on the state was instituted in Britain; Belgium opted for multiple mutual societies; Germany updated the system of funding based on the sectors of activity, which had already acquired years of experience; and France kept the system based on membership of the trades and professions. These systems were financed in most cases by contributions deducted from the citizens' wages. The coverage offered by most of these organizations included sickness and maternity insurance, occupational safety and health insurance, and a retirement pension scheme.

None of these systems was provided right from the start with the funds necessary to cover the expenses of the whole population and protect all its members equally, or with a coherent administration or an irreproachable management. Readjustments were necessary everywhere and continued to be made up to the end of the century.

During the war, the Allies had also defined the founding principles of the United Nations, which was to replace the defunct League of Nations. This time, however, Roosevelt, unlike Wilson, who had not been supported by the American Congress, drew up the rules of his own personal United Nations, of which the United States was to take control. The word 'health' was slipped almost surreptitiously into the United Nations Charter, but it meant that the idea of a health organization was accepted at the 1945 San Francisco Conference, and the structure of the World Health Organization (WHO) was approved at the 1946 International Health Conference in New York.

WHO's headquarters was to be in Geneva, and its first managing director was a Canadian, Brock Chisholm. Regional offices were opened in several places during the next few years to facilitate the collection of information and to ensure that local conditions were taken into account: Copenhagen was chosen for Europe, Brazzaville for Africa, Alexandria for the Eastern Mediterranean region, Delhi for South-East Asia, Manila for the West Pacific, and Washington for the Americas.

The member states found the health conditions in the world so disturbing that the United Nations, not content with having created WHO, set up the International Children's Emergency Fund (UNICEF). The precarious state of health of the 'displaced persons' uprooted by the shifting European frontiers and of the prisoners of war released from concentration camps suggested that a health section should be set up within the United Nations Administration to deal with relief and rehabilitation (UNRRA). For similar reasons, the creation of the State of Israel gave rise to the need for aid to the displaced Palestinians to be organized (UNRWA).

During the war, the colonial powers had continued to pursue their efforts to promote health in the countries they occupied, but they were no longer able to meet all the requirements in terms of numbers of personnel, equipment, and financial support. They therefore applied for means to be made available locally. Qualified local doctors and administrators were trained and engaged who were to form the backbone of all these countries' health departments when they gained their independence.

## 1950–1978: A PERIOD OF ENTHUSIASM

The Second World War, which few countries in the world escaped, was followed by three decades with two distinctive features. On the one hand, the industrialized countries underwent a period of economic expansion, which led to the growth of towns and industrial potential. On the other hand, many nations which had been colonized gained independence. Events of these kinds might well be expected to lead to a magnificent improvement in people's health, and possibly also to the disappearance of some diseases.

This period ends in 1978 because it was during the summer of that year that the annual World Health Assembly organized by WHO sent the world a spectacular message, which was to inspire even greater hope and enthusiasm.

**Contagious diseases**

Penicillin began to be manufactured by chemical synthesis in many countries, and within a few years, it became available all over the world at little cost. This drug was soon accompanied by other substances belonging to the same family, and by other antibiotics (Plate 79). Since penicillin destroys the most common microbes, a whole class of suppurating lesions of various kinds were eliminated in hospitals, such as the pulmonary and pleural infections which had been so common in the past, and staphylococcal osteo-articular infections, which had had such devastating effects on children.

*Table 3* **The eradication of smallpox in selected countries** *(number of cases per year)*

| | 1939 | 1955 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977–1978 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Africa** | | | | | | | | | | | | | | | |
| Benin | 58 | 16 | 165 | 490 | 815 | 367 | 58 | – | – | – | – | – | – | – | – |
| Botswana | 3 | – | – | – | 1 | – | – | – | 36 | 1,059 | 27 | – | – | – | – |
| Ethiopia | 201 | 2,662 | 124 | 358 | 466 | 426 | 197 | 722 | 26,329 | 16,999 | 5,414 | 4,439 | 3,935 | 915 | – |
| Uganda | – | 101 | 1,351 | 614 | 365 | 55 | 9 | 2 | 19 | 16 | – | – | – | – | – |
| **South America** | | | | | | | | | | | | | | | |
| Brazil | 86 | 2,580 | 3,417 | 3,623 | 4,514 | 4,372 | 7,407 | 1,771 | 19 | – | – | – | – | – | – |
| **Asia** | | | | | | | | | | | | | | | |
| Afghanistan | .... | 1,411 | 72 | 66 | 334 | 739 | 250 | 1,044 | 736 | 236 | 25 | – | – | – | – |
| Bangladesh | .... | 1,926 | 316 | 3,207 | 6,648 | 9,039 | 1,925 | 1,473 | – | 10,754 | 32,711 | 16,485 | 13,798 | – | – |
| India | 133,616 | 41,837 | 33,402 | 32,616 | 84,902 | 35,179 | 19,281 | 12,773 | 16,190 | 27,407 | 88,114 | 188,003 | 1,436 | – | – |
| Nepal | .... | .... | 70 | 164 | 110 | 249 | 163 | 76 | 215 | 399 | 277 | 1,549 | 95 | – | – |
| Pakistan | .... | 3,330 | 1,285 | 2,936 | 6,084 | 1,836 | 3,520 | 3,192 | 5,808 | 7,053 | 9,258 | 7,859 | – | – | – |

No cases: –

Not available: ....

Source: WHO, 1980, *The Global Eradication of Smallpox, Final Report of the Global Commission for the Certification of Smallpox Eradication*, Geneva.

The systematic prescription of penicillin for streptococcal throat infections transformed scarlet fever into a benign disease. Not only did school epidemics of scarlet fever become a thing of the past, but the dreaded outbursts of acute rheumatic fever also became rare.

This sharp decrease in the incidence of the most common infectious diseases obviously occurred only in countries able to afford antibiotics, which are difficult to manufacture and therefore relatively expensive. During the Cold War, the Non-Aligned Countries were collectively denoted the 'Third World'. The immediately apparent differences between the financial resources of the above two groups of countries had health repercussions, which will be frequently referred to below.

Penicillin turned out to be an efficacious means of combating gonorrhoea, but its effectiveness against the syphilis bacterium *Treponema pallidum* was surprising, as these two infectious agents do not belong to the same family. Therapeutic approaches which had been in use for centuries suddenly became obsolete, and one of the branches of venereology was completely transformed. In particular, the dreadful neural and mental complications of syphilis were eliminated, and theories about the hereditary nature of syphilis had to be revised.

During the immediate post-war period, the use of another antibiotic produced on an industrial scale, streptomycin, spread rapidly among all the Western countries. Thanks to the prescription of streptomycin in association with other drugs, tuberculosis – whether its focus was pulmonary, osteo-articular, or meningeal – could now be quickly cured. Patients with tuberculosis needed to be admitted to hospital only during the infectious stage, and the treatment could then be continued in their own homes. The many establishments which had been opened in every country both between and immediately after the two world wars to deal with tuberculosis suddenly became redundant, and were either closed down or used for other purposes.

Publicity campaigns were launched to promote vaccination with the BCG vaccine. Some newly independent countries adopted it on a large scale. Tuberculosis can spread easily among people of all ages living in overcrowded conditions, which is often the case in country huts, *favelas* and shantytowns. This period was characterized by the uncontrolled growth of towns, along with all the medical, social and moral risks which accompany crowded housing conditions and a lack of proper regard for hygiene.

Although cholera and the plague were still endemic in some African and Asian countries, the world was no longer threatened by smallpox. Smallpox vaccination, which was easy to perform and inexpensive, was generalized. WHO, which had been responsible for promoting this procedure, predicted that smallpox would be completely wiped out for humans. It is certainly true that, since the last case was recorded in Somalia, nothing more has been heard of the disease. Convinced that there was no risk, WHO offered to pay a prize to anyone who could provide authentic proof of a new outbreak.

This was the first known case of a human epidemic disease that had disappeared thanks to human efforts (Table 3), but unfortunately, it has remained the only case so far. For a long time, researchers hoped to achieve equal success with poliomyelitis, but here the difficulties to be overcome were different. The disease is spread by viruses of several different types, the vaccines do not keep well, and unlike the smallpox virus, which is transmitted from person to person, the poliomyelitis viruses abound in freshwater everywhere.

During these years of high scientific hopes, malaria was expected to be stamped out like smallpox. Research in the chemical industry, which had been stimulated by the war, led to the development of DDT, a powerful insecticide. DDT was therefore lavishly applied in the many swampy areas throughout the world where the disease was endemic, with encouraging results. It soon turned out, however, that it did not suffice to eradicate the adult mosquitoes, and that the insects began acquiring resistance to DDT. After working so hard for three decades, people began to realize that it was not possible to interfere with ecosystems without causing some harm.

Other methods of fighting malaria were found to be possible, and they were all used simultaneously. In tropical countries, care was taken to eliminate even the smallest expanses of stagnant water in which anopheles larvae were liable to develop, and intensive public information campaigns were gradually organized. The larvae were again targeted by spreading a layer of oil on the surface of still waters whenever possible. Many efforts were made to drain and dry out marshlands.

By combining all these methods, progress was definitely made (Table 4). The northern and southern shores of the Mediterranean are by now devoid of malaria, as is the whole of Western Europe, whereas one century ago the disease was present in every country in the world. The last cases to be reported occurred in Greece in 1963. Nature has also lent a hand: in Scandinavian Lapland, there are far too many lakes for it to be possible to dry them out, and mosquitoes are widespread. Nonetheless, local populations no longer suffer from malaria, probably because the endogenous anopheles have been replaced by another variety, which does not carry the haematozoon responsible for transmitting malaria to humans.

Vaccines affording protection against two other contagious diseases, measles and German measles, also became available to the public. These are mainly childhood diseases, but when contracted by pregnant women, they can lead to embryonic malformations. Since measles vaccination has become a common practice, infantile bronchopneumonia no longer occurs as frequently as in the past.

Within a thirty-year period, the incidence of infectious diseases has thus completely changed among most of the world's inhabitants. It would not be fair, however, to attribute this improvement to medical progress alone. In both the towns and the countryside, housing conditions have improved with the expanding economy. In Europe, the water mains have been extended to rural communities, thereby ending their reliance on traditional wells, which could easily escape the health inspectors' notice and were often placed in the vicinity of animal droppings.

Urban housing built after the war was equipped with bathrooms and sanitation, and the annual per capita water consumption increased ten-fold in the newly built-up areas. The construction of modern apartment blocks, regardless of whether this was the cause or the outcome of social change, meant that the older buildings no longer tended to become overcrowded by several generations living together. The acquisition of washing machines (Plate 80) by most households made underwear more hygienic and abolished body parasites, while the use of refrigerators and dishwashers improved the level of food hygiene. Of course, these improvements did not immediately reach all layers of society, even in the industrialized countries, but they played an important role in that they served to prevent the transmission of common microbial disorders.

## Sickness insurance schemes

Health care, or at least some state contribution towards the cost of medical attention in the event of illness, seemed quite a realistic aim in the post-war period, since the nations were becoming prosperous. The generous projects nurtured by the governments at that time could now be put into practice. The principle was that medical care should be partly or entirely free of charge for as large a proportion of the population as possible. There were several possible ways of achieving this.

Britain adopted the type of state system used in the Soviet Union since the 1920s, which was subsequently copied in the socialist states created after 1945, as well as in Australia and some of the Canadian provinces. The state financed and managed all the medical structures required by the population, regardless of the illness involved and the type of care required. This all-embracing system looked quite satisfactory, since it abolished the inequalities due to a person's place of residence, income bracket, or walk of life. The idea of free medical care for all seemed most appealing.

*Table 4* **Malaria morbidity in selected countries**
*(Before and after the Eradication Programme)*

| Region | Country and Stage * of Programme | Year | Number of Cases of Malaria |
|---|---|---|---|
| The Americas | Dominican Republic, M + C | 1950 | 17,310 |
|  |  | 1973 | 418 |
|  | Jamaica, M. | 1954 | 4,417 |
|  |  | 1969 | 0 |
|  | Venezuela, M + C + A | 1943 | 817,115 |
|  |  | 1958 | 800 |
| Africa | Mauritius, M | 1948 | 46,400 |
|  |  | 1968 | 14 † |
| Asia | Taiwan, M | 1954 | 1,000,000 |
|  |  | 1969 | 9 † |
|  | Iraq, M + C + A | 1950 | 537,286 |
|  |  | 1973 | 3,783 |
|  | Turkey, M + C + A | 1950 | 1,888,000 |
|  |  | 1973 | 9,828 |
| Europe | Bulgaria, M | 1946 | 144,631 |
|  |  | 1969 | 10 † |
|  | Romania, M | 1948 | 388,200 |
|  |  | 1969 | 4 † |
|  | Spain, M | 1950 | 19,644 |
|  |  | 1969 | 28 † |
|  | Yugoslavia, M | 1937 | 169,545 |
|  |  | 1969 | 15 † |

*Stage of programme is the last quoted.

M = Maintenance phase; C = Consolidation phase; A = Attack phase.

† All cases reported in countries in maintenance phase were imported or induced.

*Source:* P. Yekutiel, 1980, *Eradication of Infectious Diseases: A Critical Study*, Basel, S. Karger, p. 71 (Reprinted with permission from S. Karger AG, Basel).

France, Spain and Germany, some Canadian provinces and Israel continued in the tradition established by Bismarck. Insurance funds set up by the various professional organizations managed the sums deducted for this purpose from the employees' wages. In the case of the first model cited above, the state acquired its resources from the tax system, and in the latter case, the special funds acted as insurance companies, with the risks involved in all insurance, but with some important differences: the subscriptions had to be paid up by the employers, and employees were mandatorily insured and could not choose the amount of their insurance contributions, which was set by the state.

In both cases, the feasibility of sickness insurance depended on the prosperity of the nation. In those countries where the coverage was initially restricted to only a few categories, it was gradually extended to others (such as craft workers and farm workers), and types of care and therapeutic methods not initially included were gradually covered. In any case, the number of employees was increasing at this period of full employment, and larger sums could be spent on health: old-fashioned hospitals were renovated, and establishments were equipped with the latest and most expensive equipment invented by medical technology.

Since the egalitarian spirit underlying sickness insurance meant that hospital expenses were also covered, members of all social classes chose to attend the public hospitals, which had previously been frequented only by the poor. Since establishments were sure to obtain financial support, they proliferated in order to satisfy the popular demand for easily accessible local medical facilities. As a result, the number of hospitals actually required was sometimes overestimated.

It would have been contrary to American tradition to set up a system of this kind, which in some respects might seem to resemble assistance based on a collective management system rather than insurance. The ideal of free enterprise and a rather puritanical conception of poverty as divine retribution prevented this type of insurance from being institutionalized in the United States on a national scale. The federal structure of the United States constituted a further barrier. The example of some Canadian provinces which, as early as 1947, had adopted various schemes, showed that the states could each adopt the mode of welfare that suited them, rich states tending to behave differently from poor ones, and industrial states differently from agricultural ones, for example. The large industrial firms that were forming at that time designed their own systems of insurance for their employees. One can imagine the extreme diversity in the cost of the insurance premiums, the amounts deducted from wages and the benefits accruing to the beneficiaries. There still existed social inequalities between whites and blacks, and the latest immigrants, mostly of Hispanic origin, enjoyed neither regular income nor social welfare. The federal government therefore took steps whereby it became mandatory for all the states to aid the elderly and the destitute. Medicare and Medicaid came to the rescue of millions of people.

This description of what has been achieved in the United States and the gaps that remain to be filled illustrates the difficulties faced by any system of health insurance, whether the country involved subscribes to a free trade or socialist system, and whether it is industrialized, developing, or semi-developed, as in the case of some European and Latin American countries.

The limited financial resources of the newly independent developing countries did not enable them to extend the benefits of health insurance to the whole nation, except for a few countries with a socialist economy, such as Cuba, and some African countries. The latter were attracted by the idea of free medical care for the whole nation. In other places, where prosperity was expected to arrive quite soon, some categories of employees were given social coverage immediately, and the number of beneficiaries was planned to increase gradually.

Foreign companies were obliged by the host countries to protect their employees by insuring them against occupational accidents and disease. The profits made by these companies were assumed to be such that they could afford to be generous. The state then followed suit by insuring its own army, police force, treasury staff, and eventually, members of the teaching profession. The country's own firms were then required to participate, since their employees were increasing in number.

The expansion of the hospital system in the more affluent countries was also taken by the poorer ones to be a sign of prestige. Some of them set up modern hospitals, which although not always adapted to the local customs or to the country's administrative and technical possibilities (how were they to ensure the maintenance of sophisticated equipment, for instance?), dispensed the latest in medical and surgical care.

The gradually expanding economy attracted underemployed inhabitants from the country to the towns. The capital cities of these countries soon housed one-third of the whole population, and this situation soon became the sign of a poor country. The new arrivals were often able to find only temporary, poorly paid employment, and the numbers inhabiting wretched, insalubrious quarters grew alarmingly.

The new health policies may have benefited city dwellers with steady jobs, but they did nothing for country folk, and despite the tendency towards urbanization, the developing countries were still predominantly rural. Rather than growing food crops, the rural population tended to produce cash crops or minerals for export, which made them particularly vulnerable because the price of these commodities was subject to the fluctuations of the world market.

### The structure of public health systems

The most obvious aspect of a public health system's activities, the provision of care, is of utmost importance to the public. Governments are also concerned with this issue, primarily for reasons related to political policy and prestige. In the Eastern European socialist countries and in countries where health insurance had been 'socialized', such as the United Kingdom and the Commonwealth countries, the state and the local authorities generally made all the decisions concerning matters such as where the sick inhabitants of a given area should preferentially (if not compulsorily) consult, how the members of the medical profession should be distributed and how much they should be paid, the location, equipment and management of hospitals, the production and distribution of pharmaceutical products. A reliable administrative structure was necessary to deal with all these aspects.

Those countries with free trade economies were not attracted by this type of highly simplified management, which in fact gave the government complete financial, geographical and technical control over health care provision. In the name of free enterprise, they ended up with a two-tiered health system. Governments first had to sustain and develop public health administration at both central and regional levels. The technicians engaged for this purpose had to supervise the application of health laws, the smooth running of the local health offices, the management of the regulated health professions, and the functioning of public health establishments, and to report any human or animal epidemics constituting a risk to public health, organize emergency aid in the event of catastrophes and inform the central authorities. A professional corps of this kind requires people with training in various relevant fields such as economists, managers, and members of the health professions and epidemiologists. Many countries set up schools of public health. These representatives of the central government working all over the national territory were invested at the local level with the authority and decision-making powers of the national officials themselves. These usually competent, devoted and poorly paid people were so attentive to the state of health of the populations they were dealing with that they contributed greatly to improving the health of the world.

Alongside this public health network, private health practitioners and establishments were also developing. Although they were subject to administrative control, they and their clientele enjoyed several kinds of freedom: the freedom to set themselves up wherever they chose, to prescribe whatever treatment seemed most appropriate, to set their own fees, as long as these were compatible with the patients' private insurance schemes, and freedom for the patients to choose the physicians they consulted and the place of consultation. In this way, two sets of requirements were satisfied: on the one hand, the public health organization was there to look after the well-being of the community and to protect it from various health risks, and on the other hand, there were the free practitioners of medicine who did not need to worry about collective health issues, but were able to concentrate (quite rightly) on restoring the health of the individual patient.

In the poor countries, this dual system led to striking discrepancies. While public health structures were rather flimsy and lacked resources in terms of both staff and funding, physicians trained in Western methods opened private practices in the cities, leaving the countryside to fend for itself. These physicians earned a good living by treating patients with steady jobs, who were therefore insured. Thus, inequalities among those in need of treatment became gradually more marked.

Prevention, in comparison with these health care systems, had less visible effects, since the accidents and diseases effectively avoided and the costs thus economized are more difficult to demonstrate statistically. How can one show the importance of events that never occurred? Prevention is therefore of less value politically, since it is less spectacular than curing diseases and building fine hospitals. And yet few nations have failed to avail themselves of the advantages of preventive medicine, as the following few examples are intended to show.

The increasing use of vaccination has already been mentioned above. In most advanced countries, occupational medicine, which aims to prevent occupational accidents and disease by having all those in employment systematically examined, has been widely adopted. Preventive medical departments almost everywhere were operated at the expense of employers, who attempted to limit their scope, and thus to save money. In theory, company doctors were paid to ensure that wage earners were suitable for the positions they occupied. They were not allowed to go any further, however, or to give the persons they were dealing with an overall check-up.

The same could be said of the medical departments in charge of supervising the health of young people attending schools and universities. Even in the most advanced countries, these departments were understaffed and underequipped, their scope was too restricted, and they were badly paid. Sports medical departments, responsible for checking whether a person was fit for a particular type of sport or the competitive event, were generally more efficient because they were financed by athletes' voluntary contributions and by sporting associations.

Countries with complex administrative systems had plenty of opportunities for promoting preventive medicine. The quality of the home-grown and imported agricultural products available on the market needed to be controlled to ensure that they were safe to eat. Customs authorities had to check that articles manufactured in other countries were risk-free, including domestic and industrial equipment, toys, clothes, and fabric and building materials. The health of immigrants crossing the borders was sometimes checked to prevent contagious diseases from being introduced. Even the chemical composition of beverages manufactured at home and abroad had to be tested.

The damage done to health by uncontrolled urban expansion is well known. Only a few countries have managed to control the living conditions of the new arrivals in large cities by building special accommodation in advance on sites already provided with amenities such as roads, running water and sewage systems. This rather authoritarian method of preventive medicine was not compatible with all national cultures, however, nor could all countries afford it.

Although consumers were not always aware of it, every article they were using had been checked by the public authorities to protect them from innumerable risks. It is not possible to estimate the resulting health benefits, since only the cost of running these departments can be calculated.

Intensive hygiene campaigns were launched, using various media, depending on the cultural background of the country involved. The wording of a message and the objectives declared can produce different reactions in different places. The approaches varied (school lessons, slogans, the media, films, cartoon strips, etc.), but the themes were usually the same everywhere: teaching the appropriate procedures and the precautions to be taken when handling kitchen utensils, heating equipment and tool kits to avoid domestic accidents (these are responsible for more serious accidents than are caused by transport), informing people about the effects of alcohol on drivers of motor vehicles, how to observe the rules of hygiene in everyday life, what a balanced diet should consist of, and precautions to be taken when engaging in sexual intercourse.

As far as preventing smoking and drinking is concerned, however, no government in the world has solved the contradictions involved in educating their citizens. Although

the toxic effects of tobacco and alcohol have been clearly established for a long time, they are a source of profit to the state. Most of the countries that gained independence during this period either set up state monopolies on these products or taxed them heavily, which did not prevent their consumption from increasing everywhere. Since fashions are often imitated, recently independent poor countries tended to copy the behaviour of the wealthy countries, even when it came to their bad habits. Since they are incapable of making more reasonable decisions, states still prefer to incur the expense of caring for those who have been intoxicating themselves for years, rather than to reduce their immediate revenue by taking measures to prevent the damage. None of the states is in the least ashamed of playing the role of drug dealer.

Birth control was a highly controversial public health issue during the period under study here. Family planning set up factions within religious circles, opposing strict adherents to those with a more pragmatic outlook. Once some of the poorer countries that had succeeded in increasing their national revenue thanks to the efforts of agriculture, industry and commerce realized that the profits were dwindling because of the high birth rate, they decided to take measures to bring it down. In other countries, numbers were thought of as being the only real source of wealth for the people. In many cultures, the degree of pride a father and a mother are entitled to feel depends on the number of children they produce. This issue is also related to the role of women in a civilization: are they destined to be forever the inferior sex, or are they allowed to control their own bodies and their own fertility? Birth control therefore raises medical, social, cultural, religious, economic and other questions (Plate 81).

For the first time in the history of humanity, birth control was discussed openly throughout the world owing to two completely new methods of contraception: oral female contraception, which requires some self-discipline and is relatively expensive; and intra-uterine devices, which have to be installed by an experienced specialist. Both methods require regular medical supervision, and their cost made them unsuitable for large-scale use in the underprivileged countries, where they were the most urgently needed.

It is therefore easy to understand why governments aware of the risks associated with overpopulation have sometimes taken authoritarian measures, for example in China, where fertile couples were fined, or lost their jobs or homes. Although the full impact of these measures cannot be assessed yet, the national pattern of demographic growth certainly slowed down as a result.

In India, the male members of the population were targeted, since men can easily be sterilized by performing a brief surgical intervention requiring only local anaesthesia. Information campaigns were run in which cash bonuses were offered as an incitement, but had to be stopped because of public protest. Several thousands of men were sterilized, but in a country with a population of more than 950 million individuals, these effects were barely perceptible.

The consequences of birth control were quite limited in fact during this period, even in the most needy and overpopulated countries: too many interests were at stake, and the opinions voiced about birth control were too contradictory to have led to anything but very short-term policies.

The governments of most countries, however highly developed, paid growing attention to their public health systems because of the economic implications and the interest shown by the electorate in health systems and in the savings they entailed. Health systems were never given top priority, however, and ministers of health were never granted complete freedom of decision, but their proposals were always considered on the basis of cost and not in terms of their value to the nation's health. Throughout the world, preventive medicine and the quality of health care were seldom judged from the point of view of the benefits to the community, and health always came second to economic considerations.

In view of the demands of the public and those of the medical profession for hospitals to be built everywhere, all equipped with expensive materials (e.g., scanners), some efforts were made to introduce some rational thinking. Thus a new concept of public health planning emerged: from then on, everything had to be planned in advance – the distribution of doctors and hospitals within the country, the acquisition of sophisticated and expensive equipment, the renovation of out-dated hospitals, the amortization of radiological diagnostic and therapeutic equipment, and the transition to computer processing in the management of health insurance funds. The 'Planning-programming-budgeting system' (PPBS) in vogue in business management in the 1960s was also applied in the field of health administration. A fine example of its application in France is provided by the decision on where the maternity homes should be located. There was a choice between either having a large number of small maternity homes so that pregnant women would easily find one in the vicinity, or making exact calculations so that there would be a smaller number of maternity hospitals, permanently staffed and equipped with the latest and safest obstetrical devices. Taking the budgetary constraints into account, several measures were taken simultaneously that led to a conspicuous decrease in the morbidity and mortality of newborn infants and their mothers in France.

Public health planning required new ways of looking at medical issues, led to the training of statisticians, epidemiologists and medical computer technicians, and introduced into the field of medicine the idea of looking at large numbers. This was a real innovation, since medicine for thousands of years had always focused on finding the solution to individual problems. Those who were too naive or enthusiastic about planning at the start were also obliged to recognize its limitations. Public health problems are not all reducible to quantifiable data, and there is necessarily some degree of uncertainty. Lastly, plans were often made for a five-year period, during which everything is liable to change, namely, the wishes and needs to be satisfied, the medical techniques available, the political context, etc. All these changes might make it necessary to modify the initial plan. Experience soon taught the new public health managers that plans are necessary but that they are seldom actually carried out as expected.

These efforts at planning also revealed how intricately health phenomena were bound up with social ones. Over the centuries, the distinction had developed between the medical profession with its long-standing history, its techniques, and its scientifically based view of the world, and social workers with their closer experience of human situations and behaviour and the training in uncertainty

they had acquired in studying the relatively new discipline of sociology. Efforts were made to have the two professions work hand in hand in the context of 'community medicine'.

The idea here was to bring together the social and medical approaches to a population, so that the problems encountered by groups and by individuals would be systematically approached from both points of view. University chairs and institutes of community medicine were created all over the world. This concept was particularly popular in Quebec; and in specially created local community service centres (known locally as CLSCs), the public could find all the necessary services and professionals under one roof: experienced social workers, medical dispensaries of several kinds, outpatient consultations, and practical and administrative advice about all aspects of everyday life.

This was a good idea that was successfully applied in a number of developing countries. The older European nations were too set in their traditional ways to show much enthusiasm for this new concept. They preferred to be treated by their familiar family doctor, who was progressively given a more dynamic role to play.

After the war, the United Nations created WHO specifically for the purpose of dealing with the world's health problems, with particular emphasis on improving the poor state of health care in the former colonies (Plate 82). Not only were these new countries short of the resources and qualified staff needed to run an efficient administration, but they were also riddled with food shortages, poorly balanced diets, vitamin deficiencies, and uncontrollable parasitoses.

The efforts made by industrialized countries to aid the developing ones increased constantly between 1950 and the late 1970s. The wealthy countries stepped up their bilateral aid programmes. As WHO was not able to cope on its own, numerous other bodies had to step in for various reasons. In the field, special missions dealt with specific diseases such as malaria, river blindness, and bilharzia, to mention only a few. Administrators helped to set up the structures necessary for projects to be properly planned, and managers made sure that funds were put to good use. Aid gradually began to be provided by organizations such as the United Nations Development Programme (UNDP), the World Bank, the International Bank for Reconstruction and Development (IBRD), the Food and Agriculture Organization (FAO), which gave these countries new seeds for their crops and improved their agricultural techniques, UNICEF, and the United Nations Population Fund (UNFPA), to mention only the most well known. The activities of these numerous organizations overlapped, causing a certain degree of waste, but the specific nature of each one made it impossible to organize mergers between them: the poor profited from the disorder sown by the rich, and in their diversity, all forms of aid provided were beneficial to the health of the local populations in the long run.

The most active organization in the field, however, was always WHO. In the course of time, its structures and the number of member states changed. Some countries switched from the regional office to which they were initially affiliated to another. Tunisia, after being assigned to the European office, joined the Eastern Mediterranean one. Israel also associated itself with Europe as soon as it became a member of the United Nations. The USSR, along with a few other Soviet Republics, briefly left the organization and subsequently returned. Heated debate occurred between the People's Republic of China and the Taiwan authorities

as to who was to represent China, and a similar situation arose between the opposing governments in Cambodia. The Cold War between the communists in the East and the free-trade economists in the West encouraged both camps to acquire a clientele among the newly independent countries.

WHO was financed, like most of the other United Nations organizations, by the contributions of its member states, which were proportional to their wealth. It managed to draw further resources from special funds set up for specific public health purposes, such as controlling parasitoses or helping the victims of natural disasters in a given country or part of the world, which were voluntarily financed by some states. This initiative was not appreciated by all, since the reputedly rich countries were not all equally rich, and also because the former colonizers, for economic and linguistic reasons, had maintained their influence in some regions and wanted to continue doing so. Worldwide public health cannot be attended to without coming up against political rivalries.

For similar reasons, the scientific thinking of those in charge of WHO was not to the liking of all its members. For example, they quite justifiably attempted to explain to member states that organizing preventive medicine would have broader and more long-term effects than simply curing a list of diseases. WHO created a special terminology in this context, which the medical profession had difficulty understanding. For example, 'primary prevention' included vaccination and the destruction of vermin (such as rats and mosquitoes), which seems quite logical. The systematic screening of diseases such as cancer or high blood pressure at such an early stage that no symptoms had yet appeared was designated, however, 'secondary prevention', although this was surely no longer prevention, since the disease had already been developed in some cases. Lastly, the term 'tertiary prevention' was used for treating diseases appropriately in order to 'prevent' the after-effects, but it was not very clear how this form of prevention differed from therapy. WHO, which brought together almost 200 nations speaking nearly as many languages, working on scientific topics in certain cases not yet completely elucidated, sometimes encountered difficult linguistic and terminological problems in the course of its activities.

Be that as it may, WHO has made a unique contribution to the health of nations. It took over successfully from its predecessors in the battle against contagious disease, drew up international health regulations, and collected epidemiological information from all over the world. To make descriptions of disease more accurate, the organization drew up and revised an international system of classification of diseases. It founded a universally recognized pharmacopoeia. In its efforts to improve the nourishment of underfed children, it succeeded in regulating sales of artificial milk. WHO also launched numerous field missions and trained local people in several medical professions in countries where no vocational training structures were yet available.

International public health cooperation did not consist merely of the assistance granted to the poor by the rich. No doubt because the two world wars had provided dramatic examples of deadly conflicts that might have been avoided, some countries made noteworthy efforts from 1950 onwards to collaborate by pooling their common economic, scientific, political and cultural interests. The increase in

international communications and trading and the relaxation of cross-frontier restrictions facilitated the conclusion of new alliances between nations, depending on their geographical situation.

Europe set the main example with its numerous institutions created for various purposes, but similar trends could be observed in other regions, such as North and South America, the Arab countries, and South-East Asia. In Africa, especially the French-speaking parts, the former colonies benefited from the assistance of the pre-existing colonial health departments in the war on endemic disease, and the central African countries set up their own coordinating structures. In Europe, the European Union (formerly known as the European Community) was set up for purely economic reasons. But the Council of Europe, which had a larger membership than the Union, has created a Health Committee to deal with health-related issues. It carries out investigations and reports findings, which are not subject to the approval or the vote of all the member states, some of which can express qualified support by signing partial agreements. Among the points dealt with in this framework, we should note the European agreement concerning blood transfusions and the exchange and sale of blood supplies among Union member states.

It is not possible in the present article to examine in detail the strides made in medicine during this period, mainly thanks to progress in biochemistry, the study of living organisms and the changes they undergo in the event of disease. The discovery of deoxyribonucleic acid (DNA), an essential component of living tissues that transmits genetically inherited characteristics, was of decisive importance in the field of life sciences. We will briefly mention only a few of the innovations that improved public health.

The progress achieved in the field of infectious disease, thanks to the intensive use of preventive programmes and the increasing number of antibiotics available, has already been mentioned. The unfortunate arrival of thalidomide on the antibiotics market illustrates the difficulties associated with a universal pharmacopoeia. Since none of the international authorities is capable of guaranteeing that a diagnostic, preventive or therapeutic pharmaceutical substance is both harmless and efficacious, each country is free to authorize or prohibit the marketing of a drug within its territory. A scientific consensus has been reached over the last three decades, however, as to what tests a medicinal product should pass before it is allowed to be marketed. Its effects on the organism must be tolerated by human beings, according to its composition and the results of experiments on several animal species, healthy humans and patients with specific diseases. Most countries have agreed to adopt standard test procedures along these lines. After satisfying these tests, thalidomide was duly authorized and distributed in several Western countries, where it was used to treat pregnant women with complaints of certain kinds. In 1959, however, it was observed in Germany and Australia that women who had been given this treatment were giving birth to children with limb malformations, and the existence of a causal link was definitely confirmed in 1961. The sale of this drug was henceforth prohibited. A few years later, however, the same medicinal product turned out to be a useful means of treating non-pregnant women and men suffering from leprosy, a disease on which thalidomide had not even been tested. This devastating accident underlines the scientific uncertainty surrounding any innovation and public health

decision. Acting in favour of one group of humans may be detrimental to another group, and destroying a living species that is harmful to humanity may have detrimental effects on other more useful species.

Millions of people all over the world suffer from metabolic and nutritional anomalies, which can lead to various types of cardiovascular disease. In this context, epidemiological surveys have been carried out for several years on specific populations in the United States and Finland. The results have shown that many people have neglected their high blood pressure, thereby exposing themselves to vascular brain damage, vascular occlusion (infarct) in the brain or other organs.

The results of these and other studies have attracted attention to the harmful effects of a dietary imbalance between the lipids, carbohydrates, and proteins ingested. In the past, the knowledge available in this field focused mainly on malnutrition of weaning infants in underdeveloped countries, and on some particularly well-documented deficiencies, but after these decades of prosperity, the pitfalls of over-rich diets began to become apparent. Excessively high cholesterol levels in the blood or other body fluids can cause cardiovascular diseases that can be prevented by keeping to more reasonably balanced diets.

Without wanting to draw an exaggerated picture of the contrast between over-fed industrialized countries and under-nourished developing countries, it should nevertheless be emphasized that this contrast does exist. To be obsessed with cholesterol has become fashionable, but millions of people have actually improved their health by applying simple preventive measures and adopting more sensible eating habits. Compare this with the cost of the spectacular cardiovascular and brain surgery carried out at magnificently equipped hospital centres, or with the heart transplants now possible thanks to the discovery of HLA tissue groups, which render grafted organs compatible with the host organism. All these achievements have saved the lives of only a few thousand patients, at great expense.

Similarly, the lives of people with chronic diseases such as diabetes have been improved. The distinction has been made between those with congenital sugar assimilation deficits, who have to endure regular insulin injections all their lives, and those with less serious and less permanent forms of diabetes, for whom an appropriate diet and drugs such as sulfamides can be prescribed. Diabetics, who number several tens of thousands, are thus spared the usual complications, lead normal lives, and live longer than they did previously.

The considerable progress made in the field of electronics has provided medicine with some useful tools. Ultrasound recording methods are used to explore the various ducts and organs, and to examine embryos and fetuses with a view to detecting any anatomical anomalies and predicting any obstetrical problems liable to arise. Ultrasound scanning is a painless, inexpensive means of exploring the human body with no ionizing effects. In many cases, it has replaced X-ray methods. Although this method requires highly trained staff to interpret the results, it is appreciated in many poor countries. However, an international survey carried out by WHO showed that a great deal of expensive radiological equipment lay idle in these countries because of mechanical failures that could have been quite easily repaired.

Research on biochemical and cellular mechanisms made possible the prenatal diagnosis of chromosomal anomalies

(affecting either the shape or the number of chromosomes, as in the case of trisomy 21, otherwise known as Down's syndrome or mongolism), functional anomalies (such as pancreatic fibrosis, also known as mucoviscidosis), and blood anomalies (such as haemoglobin problems). Methods of *in utero* investigation, along with the tests carried out at birth, have made it possible to apply corrective treatment at a very early age, and they sometimes lead to termination of pregnancy.

The increasing use of multidisciplinary approaches to disease has resulted in traditional ideas about the causes of disease being completely revised. In East Africa, for example, epidemiologists discovered that the incidence of a mandibular tumour was particularly high. Subsequent studies showed that several factors were responsible for the occurrence of this malignant growth: it only occurred when a specific virus (the Epstein-Barr virus) was caught by a patient with malaria suffering from malnutrition.

Many illnesses seem in fact to result from a combination of several factors. The recognition of interconnected causes certainly revolutionized the simplistic type of reasoning based on bacteriological models, according to which one cause leads to one result and one germ to one disease. These three decades of progress in most of the branches of medicine have shown living organisms to be increasingly complex in both their healthy and diseased states. Increasing the number of biological investigations was hardly the best way to solve many problems, and in certain cases it actually delayed the discovery of proper solutions.

Another new medical discovery was the fact that the pathological problems are intertwined with the moral, religious, cultural and economic particularities of each society. The more heterogeneous human groups become, the more difficult these problems are to solve. For this reason, 'ethics committees' (where the term 'ethics' has for some reason been substituted for 'moral') have been set up in hospitals and universities, sometimes on a national scale. The innumerable topics they deal with have sometimes required creating new legislation; however, the slowness with which this is achieved underscores the great difficulties involved.

## 1978: 'GOOD HEALTH FOR ALL BY THE YEAR 2000'

In 1978, the World Health Assembly, which was attended by nearly five hundred participants, launched this slogan, like a battle cry in the war on disease, which was to be the programme for the next two decades. This event took place in Alma-Ata, the capital of Kazakhstan in the Soviet Union. To many, this laudable aim announced on the dais in biblical, melodramatic tones by the Director-General of WHO appeared to be wishful thinking or an incantation against death, since to overcome disease is to abolish death. Those who were more sceptical or cautious might have preferred the statement 'Health care for all by the year 2000', which would have been a less ambitious, but still difficult, goal.

The Alma-Ata Declaration, which naturally obtained the unanimous approval of all the participants, was designed to cause a psychological shock among the heads of the member states by forcing them to take a critical look at their public health systems and the policies adopted over the previous decades. The implied criticism had to do mainly with the way in which 'primary health care' was organized throughout the world, i.e., the care dispensed to patients by members of the medical profession, or possibly by the most appropriate substitutes available, if there were any such within reach. The Alma-Ata slogan was therefore aimed primarily at the developing countries, but the advanced nations were rather puzzled about the meaning of 'primary health care', which was part of the WHO jargon. These countries had not waited for Alma-Ata before giving some thought to their health policies. They had provided those in poor health with a sufficiently large number of physicians (if not with more than were required), and anybody in need of care could simply call in the doctor or go to a hospital. Primary health care was therefore being well attended to, and so they wondered what 'secondary health care' might mean.

It was generally agreed, however, that the criticism of Third World health policies was justified. Since the underdeveloped countries lacked both resources and authority, all they could do was to follow the public health and administrative principles they had inherited from their former colonizers: in other words, to imitate the affluent countries. Physicians trained in Western methods were in short supply, and were established in the towns. Expensive new hospitals able to perform heart surgery had been built. Meanwhile, no provision had been made for those living in the bush and in the mountains, and the villages were suffering from food shortages and lack of sanitation. There was a growing need for all countries, especially the least privileged, to develop a new system of vocational training in public health, catering for all population groups. The idea of training health officers who were not necessarily qualified doctors was put forward. Training a lower category of staff with a good basic education to teach the basic principles of hygiene in the villages might be better than an inevitably poor level of medical care.

WHO emphasized the need to make better use of village storytellers and 'witch doctors' to train experts in the field – rather than calling on highly trained physicians unfamiliar with the public health background in their country – to increase the numbers of nurses and midwives, and to dispense elementary instruction to volunteers and village chiefs on how to filter river and marsh water and how to build latrines.

The Alma-Ata Declaration was therefore a call to the representatives of both rich and poor countries to question their own consciences and to revise their policies on a worldwide scale. Since so many nations were prospering, the state of health of all humankind really could be improved if all concerned decided to commit themselves to making every possible effort.

In 1978, it was indeed possible to be optimistic about the three decades ahead, as far as the health of humanity was concerned. The main causes of epidemics had been stamped out. The mechanization of production processes had turned factories into less dangerous workplaces. Agriculture had become more productive, making famines less frequent and less disastrous. The members of the medical profession were so clever that they were always achieving better results, and there was no reason to imagine that this would not continue to be the case.

Some countries that gained independence after the war were beginning to launch on the world market products

they would never have been thought capable of manufacturing, which enriched them to such an extent that the economic gap between the wealthy countries in the Northern hemisphere and the poorer Southern countries seemed destined to decrease. Life expectancy was increasing, infant mortality was decreasing, and the population was growing even in the most deserted, destitute corners of the globe.

Of course, many people realized that the Alma-Ata Declaration would not bring about the hoped-for health revolution, but everything seemed to indicate that human beings were progressing towards a more healthy life involving less suffering, since the state of economic prosperity was expected to persist.

## 1978–1997: A PERIOD OF DISAPPOINTMENT

The outcome of the Alma-Ata resolutions was not as successful as expected for several reasons. The industrialized Northern countries felt that these proposals, reasonable as they were, once again made calls on their generosity, and the developing Southern countries did not make all the efforts necessary for the appropriate changes to be made. The difficulties encountered on all sides were exacerbated by the fact that economic expansion was slowing down considerably, resulting in cuts in national budgets. During such crises, health expenditure is always curbed. Never before in the course of history had the health of humanity been so inexorably subjected to the power of money. Moreover, some diseases unexpectedly appeared or reappeared, calling for new public health measures and occupying a growing place on the epidemiological map of the world. The enthusiasm of the previous decades therefore gave way to disappointment, although the earlier achievements were not really seriously threatened.

### Infections and parasitoses

Once the international organizations had been properly set up and statistical methods developed, fairly reliable, worldwide epidemiological data were becoming available. These, however, were only the sum of the individual national data, and the degree of accuracy of the figures reported by the various countries varied in consistency. Quality was improving, however, and the classifications published were increasingly recognized and used, so that a more accurate picture of disease in the world was beginning to emerge.

It was observed that diseases were showing a greater tendency to spread internationally, owing to the increased amount of trading and travelling worldwide. Diseases do not tend to become identical when spreading from one place to another, however, since, although germs ignore borders, the modes of human contagion vary from one culture to another, and the insects which carry some diseases do not adapt to all climates and ecosystems. For the same reasons, it seems unlikely that the level of health of the world's entire population will ever be completely uniform.

It is not within the scope of this article to draw up a list of the main diseases threatening humanity during the period under consideration. All that can be done here is briefly to outline the main successes, the lesser successes

and the failures (which, it is hoped, will prove to be only temporary).

The successful battle against the epidemics of the previous century continued. Smallpox never reappeared. Yellow fever attempted to do so once in West Africa but was vanquished. Cholera was still endemic in Asia, and after crossing the Pacific, resurfaced in Peru and Brazil before crossing over to West Africa and finally disappearing altogether. The plague, which was still endemic in Asia, occurred only in a few East African foci.

New hope sprang up in the fight against leprosy, which in 1995 affected one million people in South-East Asia, especially India. A promising new drug, dapsone, was being used, and because *Mycobacterium leprae*, like the former smallpox virus, affects only humans, researchers hoped to eradicate it in the same way. The solution in the most serious cases turned out to consist of prescribing a combination of chemical drugs, and total victory may now be within reach.

Despite all the efforts made throughout the world, two dreadful diseases still exist, the first of which is malaria. This is still the main cause of death in the world, especially among children. The use of DDT to destroy mosquitoes had been prohibited in many places, and the *Plasmodium* species, which are most resistant to antimalarial drugs, seemed to be proliferating at the expense of the more sensitive species. Early in 1980, a deadly epidemic broke out in Madagascar. In terms of the number of deaths it causes every year, malaria remains humanity's greatest epidemiological challenge.

The war on tuberculosis has also come to a standstill. Although it was extremely successful in the industrialized countries throughout the twentieth century, too many small pockets of resistance still exist. In every country, there are still places where needy people live in overcrowded homes and quarters with no sanitation, contaminating one another and forming centres of infection; and the situation is sometimes exacerbated by AIDS. For various immunological reasons, the BCG vaccination campaigns have slowed down in Africa and India.

Even the fight against infectious agents, which are amenable to vaccination (meningococci, measles) has slackened: vaccines are expensive, and their widespread use requires the existence of roads and means of conservation and transport not available everywhere. The causes of diarrhoea, which can be so deadly to children, are various and include malnutrition, poor hygiene and epidemics.

The disappointment felt as we reached the end of the century is mainly due to the fact that humankind is still relatively powerless in the face of pathogenic viruses. The great medical victories of the past were won against microbes by means of appropriate drugs, whereas viruses are naturally unstable organisms: the influenza viruses mutate, for example, from one flu epidemic to another.

The most spectacular event in recent times has been the invasion of the human immunodeficiency virus (the HIV virus responsible for AIDS) (Plate 83). After being first suspected in the early 1980s and then identified in 1985, this virus spread throughout the world via two pathways, blood and sexual transmission. It caused considerable mortality during the first decade of its existence, but HIV-positive patients are surviving longer every year thanks to new therapies. The African continent has been the hardest hit.

Thanks to the improved laboratory methods of identification, viruses can now be more accurately detected and classified. The most formidable are the hepatitis B

and C viruses responsible for severe cirrhosis and hepatocarcinomas. An increase has also been observed in the incidence of sexually transmitted diseases. Although penicillin almost eradicated syphilis and gonorrhoea, at least in the more advanced countries, viral infections such as herpes, condyloma and papilloma have by now become quite commonplace.

One of the latest threats to human health involves even more elementary living particles than viruses, namely prions. After being named in 1982, they were identified in bovines, where they are responsible for the fatal bovine spongiform encephalitis (BSE) known as mad cow disease. The exact mode of transmission at work in cattle is not yet known, nor do we know to what extent this disease can be transmitted to other species, including humans.

Since worrying comes naturally to human beings, they hope past victories will continue to be valid forever, but, actually, this is no longer certain. Most of the viral diseases occurring nowadays existed previously but had not been properly identified, and their present-day occurrence has generated a wave of panic, especially as it is impossible to control them because too little is known about their composition and means of transmission.

### The cost of health care

Research on the diagnosis and treatment of these diseases is extremely expensive and has added to the cost of health care. Moreover, it is worth noting that, for political and demagogic reasons, governments are more willing to invest heavily in research on new diseases than on older ones.

For several reasons, countries everywhere are spending more on health. Diagnostic tests are made with sophisticated electronic, magnetic and computer-controlled equipment; drug therapy requires years of research and development; and surgical procedures are becoming more ambitious and precisely controlled. Children are treated at increasingly early ages, and growing numbers of elderly people suffer from several ailments simultaneously requiring a correspondingly large number of treatments, all of which incur costs. Provision was not made for financing such additional expenditures when the health insurance systems were instituted.

Social welfare of all kinds has reached a dead end. State-run health insurance systems seem to be resisting inflation with recommendable efficiency, if one compares their morbidity and mortality rates with those of other countries, but the strictly regulated way in which health care is dispensed in those countries with such systems would not be found acceptable elsewhere and meets with a degree of dissatisfaction even among their own inhabitants.

Industrial countries' health insurance systems, financed by subscriptions or wage deductions, have swollen the costs of industrial production (owing to the inevitable repeated increases in insurance premiums) and have thus led to a drop in consumption. To compensate for this process, public funds have had to be deployed.

In the United States, where, as we have seen, other options were chosen after the Second World War, a spirit of solidarity was created between the medical professions, health administrators and potential patients who share vested interests in health maintenance organizations (HMOs). It is in the interests of both health care providers and consumers that the best possible care should be dispensed at the lowest possible cost. The risks covered have been strictly defined, however, and the most expensive ailments have been ruled out. The federal government has been attempting to reduce the cost of health via Medicare and Medicaid, as described above. In the long run, however, the number of people with no medical coverage is on the increase, while those who are insured must pay increasingly expensive premiums.

The developing countries are even less in a position to extend health insurance to further categories of people. The ideals adopted by the governments in 1945, i.e., extending health insurance coverage to the whole population and providing everybody with the same coverage free of charge, are now beyond their reach. Those countries where these goals were almost achieved have had to take a few cautious steps backwards, calling on the civic loyalty of the members of the public who, after years of large-scale state assistance, had come to believe that the rights to which they were entitled were limitless. They have been asking the members of the medical professions, who prescribe too many treatments, tests and superfluous drugs regardless of cost, to take a more responsible attitude.

Every country has had to look for solutions that are both the least risky, politically speaking, and the most likely to maintain the nation's health at its present level. It seems probable that, in the present context, the proportion of the total national budgets devoted to public health will continue to decrease, although the actual amounts spent increase. The causal links between economic prosperity, public expenditure on health, and the state of health of the population are still rather unclear.

It can certainly be said that in terms of the morbidity and mortality and the life expectancy of the population at birth, the wealthy countries are in good health, and good health depends on economic development. On the other hand, one can hardly expect unhealthy people in poor countries to make strenuous efforts to step up productivity, although favourable health statistics do exist in the case of some countries and regions with low incomes and a small population, such as Cuba, Sri Lanka, Costa Rica, and Kerala (India).

### Industry and health

The industrialization of modern societies was bound to affect people's health, for two reasons: first, the equipment necessary for dispensing health care is manufactured industrially, and second, access to certain types of instruments tends to become the prerogative of consortiums, although the efficiency and the quality of the health care to which these two processes led have not yet actually been proved. It became apparent in recent decades that some industries can actually be harmful to the population's health.

Industrial mergers began to occur in the health industry during the 1970s because the first scanners were so expensive to produce. (Even the firm that invented the procedure went out of business.) The situation worsened when the early models were updated, radiological equipment was automated, magnetic methods were introduced for abolishing kidney and gall bladder stones, automatic

analysers were developed for making biochemical diagnoses, and ultrasound recording, magnetic resonance imagery and ionizing radiation equipment became available for diagnostic and therapeutic purposes. Such innovations were consistent with medical progress, but owing to their increasing cost and the limited scope of the market, industrial firms were forced to merge and combine their production and marketing activities. By the end of the century, there were only about half a dozen companies selling expensive equipment of this kind, which means that in some countries, they have monopolized the market and industrialists are able to exert pressure on the medical profession.

A similar process has occurred in the case of the pharmaceutical industry, which expanded rapidly during the late twentieth century. The cost of research and development is certainly on the increase, for it takes at least ten years and a great deal of money for a promising new molecule to be launched on the market.

The pooling of industrial activities has had various effects. The increasing production costs have led to higher sale prices, and whenever a new truly efficacious substance comes on the market, there is much heated debate between manufacturers and governments, which are interested in buying it, but have to consider public opinion. It is therefore hardly surprising that states would prefer physicians prescribe generic drugs, which have become common property when the initial patents expired.

In addition, manufacturers are free to choose their own fields of research. There is little advantage to be gained, for example, from supplying Southern countries incapable of paying their bills with drugs designed to treat purely local diseases such as parasitoses, for which there is no demand elsewhere. And why should they bother trying to treat diseases occurring only rarely in wealthy countries, since the low demand would mean that the research investment would take too long to pay off? These two examples of 'orphan drugs' (although it would be more appropriate to speak of 'orphan diseases', since they have been deprived of specific drugs) clearly demonstrate the effects of industry on world health. Fortunately, the commercial criteria used by manufacturers to select the fields in which their innovations are to be produced are counterbalanced by the effects of competition, since a brand new discovery will always attract considerable publicity.

The underprivileged countries are defenceless against economic forces of this kind. Neither their governments nor their individual inhabitants are able to acquire all the medicines they need, the price of which is set without consulting them. To prevent fashionable trends from creating demands among the public and the undesirable effects of having too many substances with the same effects but different trademarks, WHO has drawn up a list of essential drugs to guide those in charge of developing countries' internal markets. Unfortunately, these reasonable suggestions have had little effect on these countries' import policies.

Human nutrition has also been affected by the changes in the world economy. It is true that more rational agricultural practices have been substituted for the less profitable traditional methods and that crossbreeding has improved the yields of both cereals and livestock. The number of countries able to draw their sustenance from their own soil has increased year by year. Previously importing nations are now producing their own requirements

and some have even become exporters. The fluctuating price of cocoa and coffee on the world market has led some countries partly to abandon these crops in favour of produce of greater use to their own inhabitants.

There still exist, however, regions suffering from food shortages and even famine. The affluent countries have hoarded up such vast quantities of cereals, meat and dairy products (carbohydrates, proteins and lipids) that they have acquired surplus stocks they cannot use and cannot (or do not wish to) sell to those unlikely to pay their bills, even at low prices, given the cost of transport involved. As in the case of the drugs mentioned above, it might be appropriate here to refer to 'orphan food'. A few large firms are the main decision-makers in the food processing industry.

Anarchy is not the proper word for this situation, since those who produce food are entitled to expect fair returns for their work, but surely it might have been possible for the food industry to do something about the vitamin deficiencies that are particularly harmful to children, for example by making compensatory financial payments under the aegis of international health organizations?

Health care establishments, like industrial firms, have shown a tendency to amalgamate during the last few decades. A number of international companies have been created to set up and manage private, profit-making establishments, especially in the developed countries. Despite the supervision carried out by the regulatory institutions, the medical professions are sometimes obliged in this context to pursue profit-making objectives. In addition, these private establishments are not obliged to admit all applicants, and can refuse 'high risk' patients, i.e., those who may become too expensive to treat. This attitude has been adopted by some HMOs in the United States. This situation is a far cry from the ideals of public health and care available to all, regardless of class, wealth, and the disease involved.

Harmful industries have been attracting the attention of Western governments for more than two centuries, and regulations have been introduced to protect both the public and workers. By now, most countries have drawn up laws on the prevention of occupational accidents and disease, and on victim compensation. Much still remains to be done, however, since many of these laws are not being strictly applied. The employers, who nearly always have to support the cost of preventive measures, expensive safety devices and worker compensation, do all they can to deny the links between causes and effects. The inspectors responsible for ensuring that the laws are obeyed are not encouraged to be too painstaking. The most dramatic example is that of child workers, who continue to be exploited in many countries, including some with small areas and small populations where the per capita income is fairly high. Employing minors means exposing a non-negligible proportion of humanity to disease, accidents, over-exertion during periods on physical growth, illiteracy, etc. As regards occupational accidents in agriculture, although the populations of the Southern countries are rural dwellers, very little attention is paid to these inhabitants by the countries concerned.

During the last few decades, people have become enthusiastic about the idea of preserving a 'natural environment', in which a constant balance will presumably be maintained between the species and their habitats. This zeal has mainly occurred in the affluent countries, since the poor ones are far too busy trying to ensure their own

survival. The war on noxious pollution has been going on for some time, but will not be over for a long time to come, since it is difficult to identify long-term intoxication processes, and it can take several decades for the exact pathological effects of some toxic substances to be determined.

All industrial waste, liquid effluent and waste gas can be detrimental to rivers, groundwater, and the atmosphere. The list of all known pollutants still remains to be completed, but the fuss made about industrial disasters is out of proportion with the damage actually caused. Although nuclear power plants have sprung up all over the world since Hiroshima and Nagasaki, the only accident to have international repercussions so far has been the one at Chernobyl. In view of the type of power plant involved, other catastrophes on similar lines are to be feared.

The chemical industry has probably produced more pollution accidents and accounted for more victims than the nuclear industry, but its effects are felt more quickly, as in the case of the Bhopal explosion in India.

The obsession with pollution and the exploitation of environmental issues by politicians and the media should not, however, be allowed to generate a state of universal panic, which might prevent research on health-promoting innovations from continuing. The pollution of the Rhine by the chemical industries in Basel had no harmful effects on human beings. The explosion that occurred at Seveso in Italy had lethal effects only on some of the local sheep; but it gave the word 'dioxin' fearful connotations, although some dioxins are both useful and harmless. It is to be hoped that in the twenty-first century, the naive, irrational attitude towards ecology will be succeeded by a more scientific-minded approach.

## Human failings

Despite the existence of well-meaning resolutions to preserve or restore good health in the human race, strict laws and regulations, and sincere and disinterested intentions, the outcome will be successful only if these regulations are properly implemented, which is not always the case. The main obstacle is human nature, which is characterized by a propensity for pleasure, a weakness for risks and a lack of willpower.

People sometimes do not hesitate to take unreasonable risks with their own health by consuming dangerous substances, which, although they may temporarily brighten one's perception of life, in the long run are detrimental to health. Even though the dangers of alcohol have been known for centuries, millions of people consume it in excessively large quantities. The human craving for alcohol is such that no single nation has ever managed to become completely abstinent, whatever administrative or religious restrictions might have been applied.

The same can be said of smoking, since the medical corps has been proclaiming for more than a century that tobacco is detrimental to health. Although in the wealthy countries there has been a slight decrease in male tobacco consumption rates, females tend to smoke more, starting in their early adolescence. Moreover, lung cancer, which used to affect primarily men, is now spreading among women. The combined effects of these two toxins are highly lethal: even in a particularly well-informed population such as that of

France, thirty thousand deaths occurred in 1995 as the result of either alcoholism alone or drinking and smoking combined, which is ten times more than the number who died of AIDS.

The consumption of alcohol and tobacco has increased in developing countries after acquiring independence, either because the inhabitants have sought to imitate the habits of their former colonizers or because these countries have succumbed to a kind of industrial colonialism that has persisted in some areas. Judging from the amounts consumed over the last few decades, this trend seems unlikely to be curbed in the near future.

In comparison with the damage caused by smoking and drinking, the damage resulting both from drug abuse involving either coca, opium or cannabis derivatives and from road accidents caused by driving at immoderate speeds has scarcely affected the history of humanity at all, quantitatively speaking. In taking these risks, people are not obeying a death instinct (which is not a very common phenomenon, whatever the psychoanalysts may say) but are rather expressing the need to be free to make their own decisions, even if they are dangerous ones. It would therefore no doubt be both pointless and risky to take coercive measures in order to restrict this particular kind of freedom.

It would be difficult to list all the unnatural habits adopted by some groups of people, regardless of what the effects on their health may be. This can be illustrated by looking at some kinds of eating habits: errors by default can be committed, for example, by following vegetarian diets too strictly, since this can lead to severe vitamin deficiencies in new-born infants and children, especially in developing countries.

The errors of excess committed in some advanced countries can be just as dangerous as the risks to which the poor undernourished countries are exposed. The habit of eating without any regard for regularity or reasonable quantities has led in the United States, for example, to as many as 58 million overweight people who expose themselves to the risk of cardiovascular disease and high blood pressure.

Other behavioural mores harmful to health include social traditions involving maiming the body. Although tattooing, scarification, and the circumcision of boys are of little consequence as far as public health is concerned, the sexual mutilation of girls can have far-reaching effects. Every year in Africa, more than 2 million young girls are subjected to excision, clitoridectomy, infibulation, and other cruel operations, which can cause infection, sterility, obstetrical complications, and death. There is no particular hygienic or religious reason for these mutilations. They are simply part of the social tradition of some one dozen countries, whose womenfolk are badly oppressed. The governments in question know how harmful these practices are, and the fact that they do nothing about them reflects either a lack of will or inefficient administrative structures.

## Administrative shortcomings

There have in fact been many examples of failures by governments in attempts to improve their population's physical well-being. The explanation for a lack of efficiency may be purely administrative, since it is impossible to apply

health regulations in many countries for demagogic reasons or for lack of funds, or, as it is sometimes quite rightly stated, it is impossible to do good within a community where 'nobody cares, nobody feels it is necessary and nobody participates'. Economically weak nations do not yet have the means of developing their health administrations. This, as we have seen, was one of the reasons health insurance developed so slowly in some places.

On the other hand, experience has shown that the effects of health regulations cannot be fully felt unless the administration functions efficiently and is respected. As soon as a country's structures become shaky and inefficient, its state of health deteriorates: this occurred during each European conflict, and again more recently in the former Soviet Union countries, where the fall in life expectancy at birth is the result of the confusion besetting the old system of management and the delay in appointing new administrators. During the last few years, more than 100,000 cases of diphtheria have been reported in the countries previously ruled by the Soviet Union.

Once again, the newly independent countries are unfortunate. Political instability is a barrier to an efficiently managed state, and governmental upheavals can only worsen economic and social crises. In such a context poor health conditions cannot be improved. Despite the difference between the state of health of the Northern and Southern countries, the wealthy countries cannot restore the poor ones to good health if there is no self-help.

International shortcomings are also to blame. In view of its efforts to aid the developing countries, the hopes raised for the health of humanity when WHO was founded continued to grow for the first few decades of the organization's existence. But as time went by, the donating countries began to express their disappointment. Although the quarrelling between free trade and socialist countries quietened down, contributions were reduced and the deadlines for their payment were extended. The staffs of the various WHO departments were reduced, and the organization was criticized for becoming less efficient. Since staff recruitment at WHO was subject to national quota rules, those engaged were not necessarily the most competent, the most experienced and the most capable of working in unfamiliar countries. This situation generated additional criticism. The organization was also blamed for the fact that recipients did not always use the aid received from WHO for the purposes initially intended by the donors (training health executives, for example). The affluent countries expressed their displeasure by sometimes entrusting other international bodies with health missions. World health did not benefit from all these national particularities and colonialist (not to say imperialist) designs, both past and present, which were continually changing with the evolving economic and political situation.

Cooperative international efforts to promote the health of the needy countries eventually came up against obstacles such as rivalry between the financing countries and between the distributing organizations, and the sensitivity of the beneficiaries. The rift between the socialist Eastern European countries and the capitalist Western nations gave way to competition between Europe, the Far East and the United States.

In this unfavourable climate created by grasping nations, some disinterested non-governmental bodies have developed during the last few decades of the century to compensate for the failures of hesitant states. Thanks to their devoted efforts to aid destitute populations, and despite the risks they face because of the many local wars, they are rendering services official organizations cannot provide. But the resources at their disposal are too small and too irregular, and the positive results of their work seems insignificant in comparison with the desperate needs confronting them.

Given the history of the difficulties encountered in the field of health, the member countries of the European Union are aware that international cooperation is very hard to achieve. Since the EU was created for purely economic purposes, the ministers of health had no legal grounds for meeting one another. It was only at the end of the 1980s that this was achieved, and even then, the meeting could barely be considered an official one.

For a long time, the guidelines imposed by the European Union on its member states focused on subsidiary issues, such as harmonizing vocational training and diplomas in some of the medical professions. This undoubtedly enabled members of these professions to circulate more freely and work wherever it suited them, but the health of patients was not the central issue. In the early 1990s, the member states managed with great difficulty to harmonize the formalities which had to be accomplished before new medicinal products could be launched on the market. The sensitivity of various nations and the distrust between European nations were further increased by the rejection of the ambitions of non-European countries. It was in 1993, in Maastricht, that the twelve member states first introduced into their legal instruments the concept of 'protecting human health', especially 'the safety and health of workers', although this aim was not expressed in forthright terms.

There is certainly no shortage of issues on which the European Union might have taken an authoritative stand to improve health in Europe. The Council of Europe has put forward proposals, for example, as to how blood transfusion should be organized and which biochemical and immunological safety standards should be met by stable and labile blood products. Regulations of this kind have come to seem even more indispensable since many people undergoing blood transfusion were accidentally contaminated with AIDS and hepatitis, and yet the European Union has not even adopted them in the form of guidelines. Nor has the EU done anything to simplify and harmonize the mechanisms whereby the price of medicinal products is set. In addition, the member states have reached no agreement on how to improve occupational medicine as a means of monitoring workers' health.

In some industrialized and wealthy countries, the citizens are still not as fully protected as elsewhere, and it is not by imposing isolated measures on these countries that one can extend to them the full benefits of preventive medicine. Since their representatives are obsessed with their independence and their own economic problems, international organizations are powerless to provide these populations with the expected level of health protection.

## Medicine for the rich, medicine for the poor

Never before in its history has Western medicine undergone so many conceptual and technical upheavals as during the last few decades. New vaccines have been developed against

hepatitis, and a combined anti-measles, mumps and German measles vaccine now exists. Medical research on the chemical basis of genetic transmission has shed new light on the laws involved in heredity and in parentally transmitted diseases and risks. The latest findings in molecular biology have helped to explain how germs may destroy an organism's defence mechanisms, as well as how a drug is able to kill those germs. Research in this field has also helped to explain the processes involved in ageing and in degenerative diseases such as rheumatism, cancer and cardiovascular disease.

Medicine continues to find new scope: resuscitating fragile new-born babies and people injured in accidents, operating on the very elderly, removing and grafting vital organs, treating sterility, correcting abnormal pregnancies, and experimenting on human beings, whether healthy or sick. Laws, traditional social principles, religious precepts and the practitioners' individual conscience cannot guide the case-by-case decisions on matters of great urgency.

Ethics committees have therefore sprung up at an even faster rate since 1980, and some countries, after several years of study, have even gone so far as to promulgate 'medical ethics laws'. However, no single law can make provision for all the possible cases in which a moral issue is likely to arise. In any serious personal or family situation, there exist perfectly good reasons for adopting either of two equally drastic solutions, just as law courts are liable to make either of two quite contradictory judgements, based in each case on perfectly sound arguments.

Ethics committees, apart from those in some Anglo-Saxon countries, generally take collective decisions without being made collectively responsible in return. Physicians are always face to face with their patients. They alone are responsible for diagnosis and therapeutic decisions, and any advice they may seek will never in any way detract from the importance or the magnificence of their task.

Given the existence of these new technical, moral and social problems, present-day medicine cannot be infallible, despite the rational and scientific basis on which it is so firmly founded. People can find these complex principles worrying, and even in the so-called industrialized countries, some members of the population do not altogether approve of them. This explains why some people still resort, except in emergencies, to those forms of medicine known under various names such as non-aggressive, alternative, complementary or parallel, natural. None of these adjectives has any real justification, since scientific medicine is often gentle, and no forms of medicine are ever 'natural', since they all require human intervention. Whatever label they go under, their one common feature is that they have no experimental, rational or scientific justification.

To give just a few examples, one might mention in this context iridodiagnosis, psychopuncture, magnetism, auriculotherapy, the pendulum, homeopathy, reflexology, organotherapy, naturopathy, osteopathy, mesotherapy, and oneirology: some of these labels are actually an affront to etymological common sense. A patient with cancer who has been treated both at a specialized cancer centre and by a charlatan will attribute the cure to the mysterious potion he ingested at full moon rather than to the therapeutic methods developed in the course of a whole century of scientific research. People need mystery and are afraid of having everything too cut and dried. Some governments go along with these fears, accepting uncontrolled practices and allowing them to be taught and their cost covered by health insurance funds, whereas other countries forbid them and prosecute unauthorized practitioners of medicine for carrying out illegal activities. Medicine of this kind will always exist, even among the most meticulous and pragmatic of nations, as long as what has been called scientific medicine continues to deal only with organic lesions, erecting an unscientific barrier between the body and the mind.

Unable to afford all the techniques, instruments and pharmaceutical resources available to Western medicine, developing countries have had to rely on other methods. Traditional medicine exists everywhere, and is as old as Western medicine, since human beings throughout the ages have always assisted one another (Plate 84). Scientific medicine has developed on the basis of original principles and concepts perfected over centuries thanks to a thorough knowledge of human anatomy and physiology.

Ancient practices based on traditions handed down from one generation to the next have never disappeared completely despite the advent of modern medicine. In addition to the doctors of medicine with state-approved qualifications, every Western country has its bone-setters, self-appointed healers and gurus, not to mention those who practise the forms of 'alternative medicine' referred to above, who are the equivalent of the shamans found in many developing countries.

The traditional practitioners in underprivileged countries know how to view their patients in the context of their natural social and physical environment. They are familiar with the cultural background and the ancestral myths. Contrary to the materialist school of medicine, which makes a distinction between mind and matter and often attends only to the body and the diseased organs, the shaman considers humans as part of a whole coherent universe peopled with plants and animals, and possibly with invisible powers, where each element exerts sometimes beneficial and sometimes harmful effects on the others. In this context, disease is assumed to result from a lack of balance between these impenetrable forces. The treatment, intended to restore the previous state of harmony, must include the whole natural range of animal, vegetable and mineral components as well as the realm of the spirits.

For thousands of years, the local vegetation provided human beings with most of their medicinal requirements. The empirical experience acquired by generations has shown which plants can be used in such circumstances – how to prepare them by boiling, infusing, macerating and fermenting them; which part of the plant was the most useful, whether the stems, flowers, fruit, buds or roots; at what season it had the most potent effects; and at what doses its effects became toxic. This traditional lore is irreplaceable. Western medicine would be wrong to do without it, and the present pharmacopoeia includes a large number of phyto-pharmaceutical products.

It is clear that we still are unfamiliar with all the possible medicinal resources offered by the world's flora – including both the commonplace plants from the European plains and the rare, fragile tropical essences – despite the fact that this ancestral know-how was readily available. Indeed, ethno-botany still holds many secrets yet to be elucidated. Unfortunately, the necessary studies are becoming increasingly expensive and therefore do not interest the pharmacological industry, which prefers to develop new methods of synthesizing molecules.

It is quite natural that traditional medicine should make considerable use of familiar plants. The patients realize that they are part of their natural surroundings, and that by ingesting them, they will participate in the life of the universe, and therefore gain an advantageous position. Since the spirits of the forest are helping to heal them, they participate wholeheartedly in the treatment prescribed by the medicine man. Every nation has its own phyto-pharmacopoeia and its practitioners, whose competence in terms of Western medical qualifications may cause sceptics some irritation. Nobody can deny, however, that these purportedly empirical therapists are at least familiar with the toxicity of their remedies and know the threshold doses at which they become dangerous.

In other cultures, the focus has been more on the resources of the human spirit, and other more mental or spiritual techniques have been used, such as suggestion and magic, associated with conjuring and incantation. Many mental disorders have been cured by bushman psychotherapists. All religions encourage belief in myths of 'possession'.

Practices such as relaxation, sophrology, physical and mental release from stress, self-persuasion, meditation of a religious kind, and yoga, undeniably relieve many patients in many ways. Not only is the patients' physical suffering alleviated, but functional disorders can be successfully treated and in some particularly receptive cases (whose characteristics still remain to be defined), autonomic functional disorders resisting conventional drugs (changes in blood pressure, heart rate, respiratory rate, evacuative functions, etc.) respond to treatment of this kind. It is not always possible to find a rational scientific explanation for these results in terms of medical graphs and doses.

The existence of traditional forms of medicine cannot be denied, since they are to be found all over the world and suit millions of patients. No authority would be able to replace these practices by any other type of medicine, which may not be successful in all cases and presents its own disadvantages. However, neither their traditional basis (which has made them so fashionable nowadays) nor their long history guarantees that these empirical methods are bound to be efficacious. They have cured innumerable psychosomatic disorders, but no direct causal relations have ever been established so far between the imbibing of herbal tea and developments in visible, material organic lesions. It should not be forgotten, moreover, that the vast majority of those who consult the local doctor or the tribal doctor suffer from diseases that are liable to be cured spontaneously. This fact should be kept in mind whenever a therapeutic method is being critically evaluated.

Patients are therefore free to choose for themselves, which is precisely what they do. Both in industrialized, supposedly educated and cultivated countries and in backward, illiterate ones, two types of behaviour can be observed, which shows that when confronted with illness and the fear of death, humanity is the same everywhere. When a worrying or painful symptom or a functional anomaly occurs, some people first consult a so-called 'official' medical practitioner, providing that he or she lives nearby and is not too expensive. If they are still worried or the problem has not cleared up quickly enough, they wonder whether they have been taking the right medicine and consulting the right person, and they call on a practitioner of alternative medicine. By combining the two types of treatment, they hope to increase their chances of being cured, but forget that they are also increasing the risk of failure.

Other people do things the other way around. Not wanting to bother their doctor, they go to see the local bone-setter who cured their parents so well, and it is only when the results turn out to be disappointing that they decide to turn to a qualified practitioner. These attitudes can be observed everywhere.

In wealthy countries where properly trained doctors and fully equipped hospitals abound, the consequences are not too serious; it is a great pity, however, to see patients with a serious condition diagnosed too late because they wasted their time by first trying a more 'gentle' type of treatment.

It is a different matter in poor countries where the local medical traditions are familiar to all, practised everywhere at very little cost, and trusted by the patients. Ethnic medical practices should not be criticized, still less abolished, but should be put to good use. The men and women who apply them are highly respected; they are strongly committed to loving their fellow human beings, often disinterested and rarely dangerous. These people should be trained in the sound principles of Western medicine, for they would contribute greatly to improving their people's health if they were taught how to keep dwellings clean, why breast-feeding is to be recommended, the need for food to be clean and varied, the principles of hygienic childbirth, and possibly what can be done about contraception, for example.

It will require a complete integration of the two approaches to medicine – two distinct ways of looking at disease and humanity's place in the environment – before many of the world's ailments can be healed. But the economic constraints weighing on the developing countries do not leave their authorities much room for choice as far as their health policies are concerned.

Over the centuries, people in African and Asian countries have built up quite a different picture of disease from that commonly held in Western countries. Since their pharmacopoeia is very ancient, people have much less esteem for the medicinal products that are manufactured at great expense by a scientific industry that is completely alien to them. Some of them think vaccination is an illusory, dangerous attempt to oppose nature's designs. Likewise, many consider being confined to hospital to be more harmful than remaining in the comfort of one's own home.

It has been claimed that nations have gone through a period of 'epidemiological transition' over the centuries. In the poor countries, the so-called 'age of mortality' was expected to come to an end in the twentieth century, whereas the wealthy countries were said to be about to enter an 'age of morbidity'. The situation is indeed changing rapidly. The causes of mortality are disappearing in the developing Southern countries, and morbidity is increasing as more newborn infants survive and people tend to live longer. The desire and the need for medical care are bound to continue to grow, and increasing demands will be placed on medicine, no matter which tradition it belongs to and whatever its resources may be.

**Taking stock: the world's population**

Since the public health organizations have continued to develop throughout the twentieth century, one might be

tempted to take stock of their achievements so as to be able to improve them further and adjust them in the course of the new century. Such an overall assessment is not possible, however, for several reasons.

First of all, even assuming that it might be possible to define universal health indicators (i.e., indicators accounting for all the aspects of a population's life), it would be difficult to establish causal relations between the activity of a health service and a population-based phenomenon because the existence of human groups and the quality of life they enjoy depend on a set of complex factors yet to be elucidated.

Secondly, it would be necessary to establish a set of health criteria with which the two hundred or so member states of WHO unanimously agree, as well as health data collected by means of a completely reliable method designed for universal use, which for the moment is quite out of the question. All over the world, the performances of the statistical tools available are considered unsatisfactory because the differences between the various public health systems are too great. Even in reputedly well-equipped countries, the quality of the statistics varies from one region, province or country to another, and even more so, from one social sector to another.

All that we can do, therefore, is to make a few general comments, which may be regarded as either encouraging or disturbing, depending both on how they are interpreted and on which governments are attempting to draw conclusions with a view to reforming their public health structures.

The world's population is increasing, despite epidemics, civil wars, famine, omnipresent poverty, and the fears generated by the latest viruses. The tragedies that have occurred in some places – for example, in Cambodia at the end of the Khmer Rouge regime, and in the Soviet Union during its dissolution – were only temporary and had human rather than extraneous causes.

The world's population explosion is slowing down. Couples are having fewer children, either in response to governmental incitements, or thanks to the spread of voluntary contraception in some countries and among social classes that ignored the techniques a few decades ago. Since infant mortality is declining, families no longer need to have six or seven children to ensure that there will be two or three survivors. It is hard to tell, however, whether this apparently rational tendency is the result of a spontaneous process or that of a deliberate decision made by those procreating. In some regions where endemic viral diseases, such as AIDS (particularly in Africa), are taking their toll, the fact that the disease is most prevalent among the procreative age groups is liable to have serious effects. Little is known as to whether householders' income affects their fertility. But poor countries are known to produce more children than rich ones. Since the gross national product (GNP) is increasing even in the most destitute countries, the per capita income is presumably increasing. This reasoning would be valid if the GNP were distributed equally among all the citizens, which is not the case.

The reduction in the growth of the world's population should therefore reassure alarmists who imagined that humanity was expanding too fast and about to starve to death. Agricultural production is also on the increase, and too much produce is being grown, resulting in fertile land being left fallow for lack of a better system of market distribution for farm produce. By the turn of the century,

the world had slightly more than 6 billion inhabitants, which is less than the ominous numbers previously predicted.

Life expectancy at birth is rising everywhere, even in the least-developed countries. One might be tempted to conclude that, since people are living longer, humanity is in good health, and that the health authorities have grounds for self-satisfaction. This attitude would be quite justified if it were not for the shocking inequalities that have subsisted.

Every country has its poor people, and the rich benefit more than others from health services and sickness insurance schemes. Progress in medicine has done more for the well-being of the affluent and healthy than that of the poor and unhealthy. No public health or health care system has ever succeeded in abolishing the health-related inequalities between the nations, and within national frontiers the gaps are widening from one social category to another.

The situation is even more deplorable in the developing countries, where the increasing GNP is improving the health and the quality of life of the wealthy to the detriment of the poor, and where the gaps are even more conspicuous than in the industrialized countries. In this respect, the situation of the Southern countries resembles that of the Northern countries during the nineteenth century: the mean life expectancy at birth is around 75 years in the Northern countries, and barely 50 years in the Southern ones.

There also exist striking differences between town and country. Since the mid-twentieth century, towns have continued to develop much faster than rural areas. All over the world, cities began to mushroom between the two world wars, and in Africa and Asia, urban sprawl worsened after the Second World War. Contrary to earlier trends, however, health tends to be better in the towns, where there is improved hygiene and sanitation, and high concentration of wealth. In Britain, 90 per cent of the population are town dwellers. In Third World countries, one-third or more (50 per cent in Gabon) of the population lives in the capital city, except in Kenya, where only 28 per cent of the country's population live in Nairobi.

The tendency of populations to concentrate in this way is not without risks. Congested housing conditions and the lack of amenities favour the spread of tuberculosis by contagion. Promiscuity and poverty are factors conducive to prostitution and the spreading of sexually transmitted diseases such as AIDS. Circumstances of this kind tend to favour addiction to alcohol, tobacco, and psychotropic substances of all sorts.

The sight of African slums and Latin American *favelas* and the living conditions to be found there quite rightly inspire indignation. But is this indignation really justified? There are plenty of explanations for the attraction the towns have exerted on hungry, ill-nourished, under-employed rural inhabitants for over half a century. They come to join members of their clan or tribe already living there; however irregular and badly paid the work may be, it is still work. Moreover, much money circulates in the towns. The trade and industry that enrich the country leave a few crumbs for the poor; such is not the case in the countryside. As time goes by, rough tin and cardboard shacks are reinforced with breeze blocks and cement, and the water in the drinking fountains is eventually rendered fit for human consumption, since more attention is paid in developing countries to the health of the towns than that of the country, no doubt

because, contrary to what occurred in previous centuries, indignation and revolt tend to be expressed more vehemently in urban areas than in villages.

Whatever the case may be, although the most populous countries such as China, India and Indonesia have seen to it that their teeming numbers continue to live mostly in the country, it seems hardly likely that people will begin deserting the towns. In fact, the world's large cities are expected to become even more densely populated over the next few decades.

## CONCLUSION

It will be possible to take stock of public health activity during the twentieth century only with hindsight. At present, it can be stated, however, that humanity was in better health at the dawn of the twentieth-first century than at the beginning of the previous one. The fact that the simple rules of hygiene have come to be more widely observed has contributed as much to this improvement as the numerous medical innovations, but preventive vaccination from which tens of millions of people have benefited has been the main medical achievement. Improved standards of living, better nutrition, the development of tools for making both industrial work and humble household tasks easier to perform have also made a difference to one-quarter of the world's population: those living in the industrialized countries.

One cannot but regret, however, that human know-how and the resources of the planet have not been devoted more specifically to improving the health of humanity. We have attempted to provide a few partial explanations for this state of affairs, which are not intended as excuses or grounds for justifying the shortcomings. The human race, including both individuals and governments, could do better. Economic factors are bound to influence the world for a long time to come. Public health will continue to be neglected until it is recognized that the health of people and nations is a calculable asset.

# 17

## TECHNOLOGY AND APPLIED SCIENCES

## 17.1
### KNOWLEDGE AND PRACTICE

*Eriabu Lugujjo*

### INTRODUCTION

A glance at the dictionary shows that the verb 'to know' can be used in a variety of ways. We speak of 'knowing' in the sense of 'being familiar with something', to be 'aware of something' or to apprehend or comprehend as fact or truth. In his arguments about knowledge and in response to the question, 'What is knowledge?', the English philosopher Alfred Jules Ayer put forward the following questions:
 – Do the different cases in which we speak of knowing have any one thing in common?
 – Is there any difference between knowing and believing?
 – Does knowing make any difference to what is known?
 – Does knowing constitute truth?

The verb 'to know' is dispositional, and the dispositions taken to constitute knowing must be revised.[1] Knowledge is a multifaceted concept with multilayered meanings. The history of philosophy since the classical Greek period can be regarded as a never-ending search for the meaning of knowledge. In this chapter, we will follow traditional epistemology and adopt a definition of knowledge as 'justified true belief'. Knowledge is a dynamic human process of justifying personal beliefs as part of an aspiration for the 'truth'. Knowledge is created and organized by the flow of information anchored on the commitment and beliefs of its holder. This statement emphasizes the essential aspect of knowledge that relates to human activity.

The formal features of knowledge can be analysed in two dimensions: the epistemological and ontological. The former concerns the modes of expression of knowledge. The epistemological dimensions are explicit vs. tacit knowledge. Human knowledge exists in different forms; it can be articulated explicitly or manifested implicitly (tacit). Polanyi argues that a large part of human knowledge is tacit.[2] This is particularly true of operational skills and know-how acquired through practical skills. Knowledge of this type is action-oriented.

Explicit knowledge can be generated through logical deduction and acquired by formal study. It can be easily transferred across time and space. However, tacit knowledge can be transferred when there is close interaction and a harmonious relationship between learner and instructor. It can be acquired through vocational instruction in any given context.

In 'The Ontological Dimension: The Individual vs. Collective', Lam argues that knowledge within an organization can reside at the level of the individual, or be shared among members of the organization.[3] Tacit knowledge moves with the individual. However, collective knowledge is distributed and shared among members of the community through rules, procedures and routines known by all.

From the explicit-tacit and individual-collective dimensions of knowledge there emerge four categories of knowledge: 'embrained', 'embodied', 'encoded' and 'embedded' knowledge, as shown in Table 5:
1. Embrained knowledge (individual and explicit) is dependent on the individual's conceptual skills and cognitive abilities. It is formal, abstract, or theoretical knowledge. It is typically learnt through reading and in formal education. Embrained knowledge enjoys a privileged social status within Western culture.
2. Embodied knowledge (individual and tacit) is action-oriented; it is the practical, individual type of knowledge on which Polanyi focused. It is learnt through experience and in training based on apprenticeship relations. Embodied knowledge is also context-specific; it is particular knowledge, which becomes relevant in light of the practical problem-solving experience. Embodied knowledge has contributed greatly to the development of the so-called Third World.
3. Encoded knowledge (collective and explicit) is shared within organizations through written rules and procedures and formal information systems. It is formed by making tacit knowledge as explicit as possible. This is well illustrated by the principles of scientific management, which attempt to codify worker experiences and skills into objective scientific knowledge.
4. Embedded knowledge (collective and tacit) is built into routines, habits, and norms that cannot easily be transformed into information systems. It is produced through social interaction and supported by its shared cultural norms. Embedded knowledge is relation-specific and dispersed. It is an emergent form of knowledge capable of supporting complex patterns of interaction in the absence of written rules. This form is a replica of traditional knowledge.

The traditional form of knowledge combines types 2 and 4, while the modern form of knowledge follows 1 and 3.

*Table 5* **Four categories of knowledge**

|  | Individual | Collective |
|---|---|---|
| Explicit | Embrained knowledge | Encoded knowledge |
| Tacit | Embodied knowledge | Embedded knowledge |

## THE EVOLUTION OF KNOWLEDGE AS A CATALYST FOR DEVELOPMENT

Although the First World War disrupted the steady scientific and technological progress of the West, it demonstrated the role and power of science, innovation and technology. At that time, research was being undertaken in major universities in Europe, the United States and Russia. Scientists and engineers enjoyed affiliations with recognized associations and societies, such as the American Philosophical Society, the American Academy of Arts and Sciences, Verein Deutscher Ingenieure in Germany, the Royal Society in London, the Russian Academy of Sciences, the Académie royale des sciences in France, the Accademia dei Lincei in Italy, the Akademie der Wissenschaften in Berlin, the Kungliga Ventenska Psakademien in Sweden, just to mention a few. These organizations provided forums and the impetus for the exchange of ideas and the transformation of scientific research into usable products.

The first twenty years of the twentieth century were eventful, for they marked the emergence of a new world with the discovery of the electron, Einstein's theory of relativity and Bohr and Rutherford's research on the atomic structure, Broglie's wavelength, Max Planck's work on radiation, Schrödinger's new characterization of the electron and Max Born's research on statistical mechanics. Basic research of this nature had a profound impact on the scientific community, prompting it to search for further meaning and truth.

The world, however, longed for both basic research and product innovation. By 1900, General Electric Research Laboratory (GE) had been established and formally institutionalized industrial research. The GE laboratory, the first of its kind in the world, served as a model for industrial research in other high-technology fields.[4]

It is interesting to note that while inventions were being made in highly organized establishments, some non-academic inventors also appeared on the scene. Examples include R. Ruedenberg, a German who patented an electron microscope in 1931; Laszlo Biro, a Hungarian who invented the ballpoint pen in 1938; Frank Whittle who invented the first jet engine in 1937; and German inventor Karl Zuse, who patented a calculator in the same year. Some of these innovations did not arise out of societal needs. They were the product of talented minds working freely without restriction.

While the West was occupied in intense scientific and innovative activities, inhabitants of the Third World (at the time still colonies) were living and sustained through application of inventions based on indigenous knowledge and practices and through exploiting their resources. Such local knowledge is still unique to particular cultures and highly valued, even though the West does not seem to agree with its practice and results. It is therefore not surprising that the last century has witnessed a systematic denial and abandonment of indigenous knowledge and a preference for Western knowledge and innovation. Early indigenous innovations have been suffocated, and new generations in developing countries have been indoctrinated to the point of not believing in these products of their own culture.

There are however exceptions to the above statement. India has progressed quite well in both modern scientific research and indigenous knowledge. Between the 1920s and 1940s, a truly Indian scientific community emerged in parallel with colonial science. Moreover, the Indian scientific community acquired a distinct identity in the international sphere of science through applying knowledge from the laboratory to national needs.

As regards China, it had played an important role in the history of ancient world civilization and made many outstanding discoveries and inventions in the realm of science and technology. However, owing to many socio-economic and political factors, China's science and technology lagged behind up to the birth of the People's Republic of China in 1949. Even after this period, the Cultural Revolution disrupted most of the intellectual activities of the country. Real economic construction and programming started in 1978, when science, technology and innovation to solve people-centred problems were emphasized.

Innovative programmes in Europe were affected in 1933 when Hitler came to power. Scientific workers either devoted all their efforts to war armaments or left their countries of origin. It has been noted that active research in Europe not directly linked to defence resumed after the end of the Second World War. This clearly demonstrates that innovation requires an enabling environment of peace, optimism and hope, recognition and financial support.

### Knowledge, necessity and innovation

Technology and inventions are intimately associated with a broad spectrum of human needs, whether these are dictated by the physical conditions of existence or by 'cultural' factors derived from the historical specificities of different social groups. These cultural or acquired needs can be 'natural' and organic, or they can be induced and manufactured either through advertising or by centrally planned manipulation of needs.

The issue of knowledge, invention and necessity sometimes poses a dilemma. There have been cases where inventors were neither driven to create by necessity nor directly linked to the immediate uses of their inventions. Innovation requires a free mind uncluttered by preconceived ideas and arises from independent thought. For example, the inventors of Kodachrome were musicians, the inventor of the Xerox photocopier was a patent lawyer, and the inventor of the ballpoint pen mentioned above worked as a painter, journalist and even a sculptor.

The last century has also witnessed inventions made by independent workers unaffiliated to big corporations. American brothers Wilbur and Orville Wright (Plate 85) patented their aeroplane early in 1904; Juliot-Curie patented nuclear fission applications in 1934; and Robert Watson-Watt patented radar in 1947.

In developed countries, inventions have long been registered and recognized through a secure patent system by which the inventor and the entrepreneur/industry can safely negotiate appropriate terms to translate the invention into a product. The process of transforming an invention

into a profitable product has always been complex as it involves many actors. Technical and socio-economic issues have to be studied and a margin of profitability established.

In the developing world, many innovations arising out of indigenous knowledge have been made, although no international patents have been issued. Innovations in agriculture, medicinal plants, traditional hydrology, and herbicides, just to mention a few areas, are well documented at the local level. However, the transformation of these inventions into products has been and remains a major problem owing to a number of reasons, particularly the restricted size of domestic markets, the comparatively high cost, the scarcity of foreign exchange, lack of financial resources and the limited number of industrial entrepreneurs.

**Cultural dimension in technical change and development**

At the turn of the twentieth century, the Western world had built up a scientific and inquisitive culture based on political will, intellectual capacity, and an organized institutional base. The political will manifested through a political culture framed coherent science policies, which embodied all the aspirations of the various countries in the region. These science policies constituted 'White Papers' for scientific development. It is therefore not surprising that the United Kingdom, the United States, France and other countries have continued to allocate sizable financial resources to science and technology.

Developed nations have always valued intellectual capacity as a resource and indeed encouraged collaboration among scientific workers. The degree of recognition has markedly changed, as knowledge has become increasingly market orientated.

Developing countries that recognized the role of science and technology as an engine of development and embraced it at policy and technical levels have made remarkable progress in the last thirty years. India, Argentina, Taiwan, Singapore and the Republic of Korea spend greater than 0.5 per cent of their GNP on science and technology development. Essentially they have embraced the science and technology culture through importation and adaptation coupled with collaborative research and development. Other regions, especially the least developed countries, have remained backward in science and technology, prompting Rosenberg to observe the following:

Many of the major innovations in Western technology have emerged in the capital goods sector of the economy. But under-developed countries with little or no organized domestic capital goods sector simply have not had the opportunity to make capital-saving innovations because they lacked the necessary capital goods industry. Under these circumstances, such countries have typically imported their capital goods from abroad, but this has meant that they have not developed the technological base of skills, knowledge, facilities, and organization upon which further technical progress so largely depends.[5]

As we begin the twenty-first century with the knowledge revolution, the least developed countries have a chance to participate in world affairs through information and communication technology. However, merely having access to knowledge will not significantly impact their development unless people, governments, industries and educational institutions are encouraged and able to put that knowledge to effective use. To a great extent, the capability to do so is closely related to people's education and skills. But even more important are the roles of incentives and the institutional structure of the economy.

## CONCLUSION

Knowledge and practice has spurred revolutions in human history. The revolutions based on materials and production of the first half of the twentieth century have been replaced with a knowledge-based revolution. The knowledge revolution was born with the invention of the transistor and the subsequent improvement of manufactured integrated circuits, which led to the new technologies that enable us to process and access information remotely.

The way nations utilize knowledge to innovate has greatly determined their progress and socio-economic well-being, while also creating a new form of knowledge imbalance between developed and developing countries. The future of humanity demands careful planning of institutional structures that are flexible enough to access, organize and apply knowledge. This is the present challenge for all of us.

## NOTES

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# 17.2
# AGRICULTURE

*Eriabu Lugujjo*

## EARLY AGRICULTURAL PRACTICES AND KNOWLEDGE

Most of the agricultural practices in the early part of the twentieth century were inherited from the research, techniques and developments of the Industrial Revolution. Some of the notable innovations, practices and knowledge are briefly discussed in the present article.

Popularized by Charles Townsend in the eighteenth century, four-field crop rotation of turnips, wheat, barley and clover was a common practice in the twentieth century. This rotation produced both fodder for livestock and cereal grain, and helped to control weeds and to maintain soil fertility. Nicholas Appert, a Frenchman, developed the technique of canning food by preserving products in sealed jars and heating to high temperatures to kill bacteria. In Leicestershire, England, Robert Bakewell pioneered the selective breeding of cattle and sheep to produce leaner animals. In the early 1800s, a new kind of agriculture, known as plantation agriculture, was developed in Tennessee (USA), where cotton was the predominant crop.

In the 1880s, Austrian scientist and monk Gregor Mendel discovered the basic principles of heredity through carefully controlled experiments in cross-breeding. His work paved the way for improving crops through genetics. Hybrids are the offspring of parents from different breeds, varieties or closely related species and are often superior in many ways to their parents – a phenomenon called hybrid vigour. For example, hybrid pigs grow faster, and their meat is leaner. In the 1920s and 1930s, scientists improved many crops such as corn (maize) by hybridization.

In addition to corn, important local crops in the early 1900s were wheat, oats, rye, barley, onions and potatoes, while important livestock were hogs and dairy and beef cattle, sheep and laying hens. In the early 1900s, notable improvements were being made with crops and livestock, and new practices were introduced such as the liming of soil to reduce acidity, terracing hillsides, building better drainage systems and installing erosion check dams. Irrigation systems, mixed farming and stock raising practices were improved.

Rain-fed agriculture was practised in arid lands. This is sometimes called 'hazard agriculture'. The productivity of farming in semi-arid environments is limited by water availability, and interactions with herders have not always been conflict-free. Hazard agriculture involves the manipulation of soil by tillage, reduced water loss (from weeds, etc.), the proper choice of plants (breeding), traditional cropping until the yield declines, and abandoning fields periodically. Moreover, water input is controlled solely through the timing of planting. Concerned areas include: the Sahel, parts of Angola, Tanzania, Northern Africa, Arabia, Iraq, Iran, Afghanistan, and Pakistan.

### Early agricultural equipment

In the 1800s, farmers and blacksmiths introduced various modifications to the plow that provided a sharper and stronger cutting edge (share) and smoother surfaces so that soil did not stick to either the plowshare or the moldboard. John Deere's plows became a standard of excellence in the 1850s, but Deere was neither the inventor nor the only manufacturer of steel plows. Deere's contribution to the plow consisted of manufacturing a large number of high-quality plows at a competitive price. Steel plows, however, were expensive, and both Deere and other manufacturers sold many cheaper iron plows that were manufactured by various processes for strength and smoothness for the benefit of the growing number of prairie farmers.

The western frontier moved through Illinois in North America. Many of the early immigrants to Illinois brought relatively simple equipment that they had used in the east: the wagon, plow, harrow, axe, rake, scythe, fork and shovel. Most of the equipment used in the early 1900s was the result of ideas developed in the preceding decades. Many of the techniques and methods that were discovered in the nineteenth century continued to be applied in the 1900s.

The seed drill, invented by Jethro Tull, was the first agricultural machine. It cut furrows, sowed and covered seed. Delivering increasing yields and enabling more efficient use of seed, the seed drill showed how farming could be made more productive through the use of machinery to replace hand labour. James Watt patented an improved steam engine, and steam technology later led to the development of powered farm machinery.

The combined harvester, which cut and threshed grain crops, came into widespread use in the western United States in the early part of the twentieth century. It reduced the amount of labour needed to harvest a field of wheat by more than 80 per cent. More efficient and less cumbersome than steam-powered tractors, gasoline- and diesel-powered tractors gradually became the principal agricultural workhorses in many parts of the world. The tractor, first introduced in the 1920s, is to the farmer of today what the horse was to the farmer of 1900. Mechanization has also produced more specialized pieces of equipment such as combines and planters, which in some cases incorporate the latest advances in computer and satellite technology.

**Early developments in agriculture**

In parts of the United States, a minimal crop response to manures and commercial fertilizers with soils that had been used for continuous corn production for 15 years was reported in early 1900s. More research was done on the use of fertilizers, and crop yields increased in subsequent years. Growers started planting a mixture of crops both for home consumption and for the market. Wheat, corn, oats, barley, rye, flax, and potatoes could be commonly found on farms in addition to vegetables and fruit grown for home consumption. Some attempted to redress limited availability of lumber by planting trees, and such initiatives led to a slight expansion of the forested area. The emergence of railroads meant that people could bring lumber and fuel from other parts of the country in exchange for agricultural commodities.

Horsepower had replaced oxen power, some commercial fertilizer was used as well as livestock manure to maintain soil fertility, and crop rotation with legumes had become a common practice in some parts of the world. Horses and mules were used for draft power, and a good portion of the oats that farmers grew went to feed the horses, although a considerable amount of it was sold for human consumption as well. Land that was too wet to cultivate was initially used for livestock grazing.

A distinctive system of agricultural manufacturing that emphasized mass production, low cost, and interchangeability of parts was developed in the Americas and soon spread to many European countries. This system of manufacturing created many products, some of which were used on farms to increase the productivity of each labourer, in harvesting, planting and cultivating fields. Advances in textile manufacturing equipment increased the demand for cotton. Manufacturing also created a demand for labour. An increasing percentage of the population would find employment in the manufacturing sector and fewer in agricultural production.

As farms became increasingly mechanized, one family could farm more acres. For example in Illinois (United States) in 1900, the number of farms reached 260,000, each averaging about 125 acres in size. The number of farms declined gradually at first to 200,000 in 1950, and then dropped precipitously to 82,000 in 1990. Correspondingly, the average size of a farm increased from 150 acres in 1950 to 340 acres in 1990.

It should be noted again that development was not restricted to the Western world. The Mossi people of Burkina Faso developed stone bounding early in the twentieth century. The bunds (lines of stones) were built up over the years and reached one metre in height, effectively terracing the slopes for relatively little labour input, most of it during the dry season. In later periods of political turmoil and land alienation, the bunds were abandoned. However, after a series of droughts in the 1970s, the stone bunds were spontaneously revived and combined with 'zay' or pits which conserve water and in which organic material is placed to increase soil fertility. Because of the further developments in this technique, sorghum yields have risen by up to about 40 per cent in fields with bunds.

The tin can for food preservation, through the canning process, and the first practical reaper of grain or grain harvesting machine were invented in the early 1900s. A pioneering German chemist, Justus von Liebig, made many important contributions to organic chemistry and to the basic principles of agricultural chemistry. He was one of the first to propose the use of chemical fertilizers. The development of the chemical fertilizer industry in the 1840s, following the work of von Liebig, in Germany, and early agricultural scientists such as Lawes and Gilbert, in England, had a major impact on agricultural productivity in the early part of the last century.

The railway and steamship lines expanded, opening up new markets. Improved methods of refrigeration and canning made possible the long-distance marketing of perishable agricultural products. French microbiologist and chemist Louis Pasteur pioneered the study of microbes in the late 1880s. He showed the role of micro-organisms in fermentation, devised pasteurization as a way of preventing beer and milk from souring, popularized sterilization and developed a vaccine.

Introduced by the Swiss in 1939 as a synthetic chemical insecticide, DDT virtually wiped out many insect-borne diseases. Before its harmful effects were discovered, it was heavily used in agriculture around the world. DDT was still being used in the developing countries in the 1980s. In the 1940s, through scientific advances and improved management techniques, farmers produced more food than ever before using less land and labour, but more chemicals, energy and capital.

Francis Crick and James Watson in 1953 discovered the structure of DNA – the genetic basis of all living things. This made possible genetic engineering, which, for agriculture, could mean genetically improved plants and animals, more resistant to disease, and more productive. The late 1950s saw the introduction and widespread use of artificial insemination for breeding livestock. Thanks to this technique many offspring from selected males can be produced.

## AGRICULTURAL DEVELOPMENT

**Scientific and technological developments in agriculture**

The global agricultural system relies heavily on mechanization, in the processes of clearing, planting and harvesting. The aim in today's technologically advanced agricultural system is to reduce labour inputs and productions costs.

In developing countries, especially in the early 1980s, farmers began using computers to keep farm accounts, to

monitor crop prices and weather conditions, and to assist in farm management.

Presently, scientists working in agriculture have delved into other fields, including medicine, biochemistry, biophysics, computer science, and the social sciences. As new scientific discoveries and developments take place, many of them have direct and indirect effects on agriculture and our lives.

Biotechnology came into the limelight in the last century, and the possibilities for its agricultural applications are only beginning to unfold. The role of biotechnology in agriculture has been described as a precursor to another Green Revolution that would be a boom for eliminating world hunger.

Biotechnology finds agricultural applications through its awesome potential to manipulate single genes at the molecular level. It has virtually eroded all biological barriers that prohibited inter-specific crossing. Genes can be transplanted from one organism to another to carry out special biological functions; micro-organisms can be engineered by alterations in their genetic structures and introduced into a given plant species to change the genetic regulation in the host; genes may be selectively eliminated or added. Biotechnology has resulted in increased disease-resistance in plants, and enhanced environmental tolerance, such as the ability to grow in salty land or endure long periods of water deficiency.

In the area of livestock and animal husbandry, researchers are looking for ways to increase production of vitamins and amino acids for animal feeds. Similarly, research is underway to exploit the animal growth hormone to stimulate meat production and develop vaccines against animal diseases. Therefore biotechnology gives total control over the production and reproduction of agricultural products and other biologically active micro-organisms.

## Effects of scientific and technological developments on agriculture

The technological advances, along with an abundance of inorganic fertilizers and pesticides, have made it possible, and indeed cost-effective, for farms to expand. Moreover, indigenous knowledge (IK) techniques have been introduced in agricultural practices, because in most developing countries, the overwhelming majority of the population is involved in small-scale farming of less than two hectares of land. These farmers represent hundreds of distinct languages and ethnic groups. In most instances, the knowledge systems of these farmers have never been recorded systematically in written form; hence they are not easily accessible to agricultural researchers, extension workers, and development practitioners. While they remain invisible to the development community, many indigenous organizations are operating in rural communities to search for solutions to community problems. Indigenous knowledge is unique to a given culture or society and constitutes the information base for a society that facilitates communication and decision-making. IK is the systematic body of knowledge acquired by local people through the accumulation of experiences, informal experiments, and intimate understanding of the environment in a given culture. Results of the incorporation of science and technology in agriculture have made it very productive and competitive.

## Modern agriculture

Until about four decades ago, crop yields in agricultural systems depended on internal resources, recycling of organic matter, built-in biological control mechanisms and rainfall patterns. Agricultural yields were modest, but stable. Production was safeguarded by growing more than one crop or variety in space and time in a field as insurance against pest outbreaks or severe weather. Inputs of nitrogen were ensured by rotating major field crops with legumes. These rotations suppressed insects, weeds and diseases by effectively breaking the life cycles of these pests. A typical US Corn Belt farmer grew corn rotated with several crops including soybeans, and small grain production was necessary to maintain livestock. The family with occasional hired help carried out most of the labour, and no specialized equipment or services were purchased from off-farm sources. In this type of farming system, the link between agriculture and ecology was quite strong, and signs of environmental degradation were seldom evident. Modern agriculture uses scientific and technological advances to improve on these practices and methods.

A noteworthy example of modern agriculture in Africa can be found in Zimbabwe, where both cropping and animal husbandry are practised extensively in the suburbs. Current projects call for informing local policy-makers on key urban agriculture issues, providing relevant training, facilitating dialogue with urban farmers and recommending key changes for improved urban agriculture management in the country. Expected results include a computerized mapping system, a planning manual on urban agriculture and support documents, as well as control measures by local authorities.

## Social, economic, and environmental effects of agricultural development

Agriculture constitutes the economic base in many regions of the world. For some nations, agriculture is the most important industry, providing a high percentage of the gross domestic product (GDP), employing directly or indirectly a large part of the total work force. In addition, agriculture is an important source of raw materials for many manufacturing industries, and in turn is an important market for manufactured goods. Measuring the effects of technology choices on productivity is crucial to understanding the determinants of agricultural growth. Investments in technology have yielded large gains for agriculture, and the benefits have been passed on to consumers in the form of lower prices. In this way, public spending on agricultural research has been justified. Agricultural expansion brought 'unproductive' land into production, and yields per hectare even increased. As a large amount of land is used for cash crop production, the number of absentee owners has increased.

However, as agricultural modernization progressed, the ecology-farming link was often broken as ecological principles were ignored and/or overridden. In fact, several agricultural scientists have arrived at the general consensus that modern agriculture entails environmental crises. A growing number of people have become concerned about the long-term sustainability of existing food production systems. Certain evidence seems to indicate that whereas

the present capital- and technology-intensive farming systems have been extremely productive and competitive, they also give rise to a variety of economic, environmental and social problems.

Conventional agriculture has caused economic problems associated with the over-production of crops, increased costs of energy-based inputs and decreasing farm revenues. It has also produced problems such as insufficient ecological diversity, soil and water pollution and soil erosion.

The plowing up of mollisols has led to massive soil erosion in many places around the world. Dry farming methods aggravated this problem in the 1900s. The use of fertilizers also masks the loss of soil nutrients. Additional problems include soil salinity and rising ground water. The erosion threat remains serious, even if some soil conservation measures reduce crop yield.

## CONCLUSION

There have been many developments in the field of agriculture in the twentieth century; particularly significant has been the increase in land and labour productivity. A comprehensive examination of data from many countries shows that during the period from 1967 to 1992, some 81 per cent of the world's population lived in countries where agricultural growth exceeded population growth. However, it must be added that this average figure masks the situation in developing countries.

The major question facing us today concerns the types of environmental and resource-related agricultural policy adjustments that can properly deal with the costs of resource degradation and increase long-term prospects for sustainable development. Various public policy approaches have been proposed, discussed and analysed with regard to their environmental and resource impacts in both industrialized and developing nations.

A growing number of countries and research institutions are undertaking biotechnology research. This is often, however, more a consequence of 'science-push' than 'demand-pull.' Individual research projects and programmes are often undertaken in the absence of clearly defined national priorities for biotechnology. In addition, biotechnology is not generally integrated within the broader national policies and institutional frameworks.

There appears to be a need for greater selectivity in biotechnology research to avoid the risk of 'reinventing the wheel'. Research effort is highly concentrated in the public sector, sometimes in newly established biotechnology institutes, with very little involvement on the part of the private sector, although efforts are being made to strengthen public/private sector collaboration in many countries. Recent advances in biotechnology have led to the cloning era, which brings to the fore new threats and ethical implications.

In the developing countries, efforts should be made to increase and diversify agriculture by introducing new crops, expanding livestock, poultry and dairy production, and developing local industries to process agricultural products. Institutions of higher education should also promote agricultural training and development through more practical-oriented programmes. At the policy level, the agricultural sector should be given more resources to support programmes at all stages of development.

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# 17.3

## THE OCEANS
## RESOURCES AND MARICULTURE

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### INTRODUCTION

Mariculture is the cultivation of food organisms, e.g. fish, shellfish, and algae, under controlled conditions to be commercially harvested for human consumption. While mariculture is a growing industry, it is an expensive process and results in a product that is not affordable by the world's poor.

Extensive mariculture has a relatively long history. For example, the ancient Romans were familiar with oyster culture. However, commercial production of seafood or industrial chemicals by mariculture is a recent development. Mariculture is a competitor for space in the near shore coastal zone, and it is generally considered that its development and daily operations should be compatible with existing coastal zone uses.

### THE OCEANS

The oceans are believed to have formed in the process of the Earth's cooling. The most popular theory is that our planet was originally a molten mass drawn off from the sun by the attraction of a passing star. As its outer portion cooled, a crust formed. This cooling crust contracted, and the thermal pressures of the gases and boiling mass within shattered the thin shell. Boiling lava broke through, consuming the crust, but reducing the temperature of the molten mass so that the surface of the globe could once more solidify. After this had occurred numerous times, the heat of the melted rock was sufficiently reduced for the relatively hard shell to form.

While the Earth was still almost as hot as flowing lava, heated gases condensed into water to fill pockets. Perhaps this water was turned to liquid vapour many times during the cooling of the Earth. Eventually, however, the crust hardened and held the water in the permanent basins, which eventually gave rise to the oceans.[1]

#### Ocean zones

The ocean can be divided from its surface to its depth into three zones based on the amount of light received. They are:

- The sunlit zone: This top layer nearest the surface also called the euphotic zone is about 180 metres deep. In this zone, there is enough light penetrating the water to support photosynthesis, which accounts for the fact that more than 90 per cent of all marine life lives here. The sunlit zone is the habitat of most fish and plankton, microscopic organisms that form the basis of the food chain in the ocean.
- The twilight zone: Also known as the disphotic zone, this is a murky part of the ocean beginning at about 180 metres and extending to some 900 metres. Only a small amount of light can penetrate the water at this depth. As the water becomes deeper, the pressure increases. Plants do not grow here and only those animals that have adapted to little light can survive in this zone. These animals include lantern fish, rattalk fish, hatchet fish, viperfish, and mid-water jellyfish. This zone is also home to some squid and fish that can use their bodies to make light (bioluminescence).
- The midnight or aphotic zone: Ninety per cent of the ocean lies in this entirely dark zone where the pressure is extreme and the temperature near freezing. The living things found here are found close to cracks in the Earth's crust, which emit mineral-rich materials. Special forms of bacteria utilize hydrogen sulphide from the cracks for energy to make food. These bacteria nourish all other living things in the midnight zone. Animals in the midnight zone include anglerfish, tripod fish, sea cucumber, snipe eel, opposom shrimp, black swallower and vampire squid.

The oceans may also be viewed as having both a horizontal and vertical dimension. The vertical dimension is the water column. The horizontal dimension has two aspects: the high seas and the coastal margin, a complex system where land, sea, freshwater and atmosphere interact. Coastal ocean waters are characterized by a high degree of variability in biochemical and biological properties.

The marine microlayer (the boundary between ocean water and the atmosphere) is responsible for biological, chemical and physical processes that affect nutrient distribution in ocean water, the uptake of greenhouse gases from the atmosphere and the exchange processes for provision of oxygen to marine organisms. The marine

microlayer is destructively affected by oil released through slick formation.

Oceans may be considered giant heat ponds collecting and storing solar energy in a warm subsurface layer beneath the marine microlayer. This subsurface layer varies in depth depending on geographic location, currents and other physical factors but rarely exceeds 20 metres. Because of its nature, this layer supports many species and humans favour it for recreational activities.

The thermocline is the layer separating the surface layer from deeper waters marking a temperature drop of 5 °C or more. Marine plants useful to mariculture have their roots in deeper, cooler waters.

The abyssal depth is the lowest part of the ocean, with temperatures between 40 °C and 60 °C. It is rich in nutrients and virtually free of pathogens. A profusion of life forms, known as extremophiles, inhabit this region, and they have evolved unique mechanisms to survive in their inhospitable environment. They reside near the numerous hydrothermal vents that break through the seabed and release heat from the Earth's inner core.

### Marine life

The oceans provide a safe haven for biologically diverse life forms ranging from the smallest known, the virus, to the largest, the blue whale. Marine animals may be divided into those that are warm blooded and those that are cold blooded. All the marine air-breathing mammals such as whales, porpoises, dolphins, seals, walruses, etc., belong to the warm-blooded class. Tropical and subtropical marine waters support a greater diversity of life than colder waters.

The least developed countries possess the most potentially valuable marine resources since most of the tropical waters are situated within the territories of the developing nations. Animal life on the surface depends on oxygen for energy and carbon as a building material.

In the abyssal depths, animals thrive on the methane-sulphide- and hydrogen-sulphide-rich waters produced by the hydrothermal vents. An interesting survival mechanism is the unique symbiosis between micro-organisms, clams, and mussels (tube worms).

### Ocean farming

The oceans cover about 71 per cent of the Earth's surface and thus receive more than twice the solar energy received by the land. This would lead us to conclude that the oceans' potential productivity greatly exceeds that of land. Ocean areas considered fertile are found where runoff from the land or the upwelling of nutrient rich deep water fertilizes the surface water. This stimulates growth of marine plants, photosynthetic organisms on which all other marine life depends. Instead of devising efficient fishing means, man needs to learn to develop the potential of oceans by farming them. Oyster farming is one of the earliest types of marine farming.

### Ocean resources

The history of exploitation of the interface of the floor of the ocean with the overlying water spans the relatively short period of approximately 120 years. This is related to the remoteness of the deep sea and the resulting difficulties in studying this environment: the methods of study are restricted by the need for instrumentation and observation chambers to be encapsulated in the atmosphere of the surface, and strengthened against the crushing pressure of a water column several kilometres high.

In the mid-nineteenth century, investigations for life on the bottom of oceans were conducted by Norwegian pastor/naturalist Michael Sars, who listed nearly 100 species of invertebrate living at depths greater than 600 metres, and British explorer John Ross, who discovered the many-armed basket star. On the basis of these explorations, Irish naturalist Wyville Thomson was convinced that life could be found at the ocean's greatest depths. Thomson's work laid the foundation for our present knowledge of the life of the deep sea floor and represented a quantum leap for the infant science of oceanography.[2]

### EARLY FISHING AND OCEAN FARMING PRACTICES

Ocean farming is not new to the world. Many countries have been interested in this area for a long time and have developed various techniques of harvesting ocean products. Some of the regions with a long ocean farming history are discussed below.

### Aquaculture in China

Freshwater fish culture in China has been recorded for over 3,100 years. Mariculture of certain molluscs existed some 1,700 to 2,000 years ago. Modern aquaculture started in the early 1950s as a result of technological advances and organized government efforts, and the Chinese aquaculture industry grew steadily between the 1950s and late 1970s, and major advances in hatchery production technology were made during that period. However these technical advances did not lead to rapid increases in production in China for social and economic reasons. Starting in 1978, China began implementing a series of economic policy changes, gradually replacing central planning with a market economy. As a result, the Chinese aquaculture industry began its rapid expansion in the early 1980s.

The most important species are silver carp, grass carp, common carp, bream and black carp. Chinese carps are mainly farmed in polyculture systems in earthen ponds. In a typical polyculture system, carps with different feeding requirements are stocked together at certain ratios to fully utilize food resources in the system. As their name indicates, grass carps are herbivores and fed with grass. Solid waste from grass carps supports phytoplankton and zooplankton blooms, which are utilized by filter feeders such as silver and bighead carps. The Chinese also raise high-value species such as the river crab, shrimp, crawfish, eel, trout, frogs, and turtles.

Molluscan culture in China started to expand beyond the four traditional species in the 1970s. Mussel culture was the first new industry to emerge, followed by scallop and abalone aquaculture in the 1980s. Shrimp culture has been a major cash industry since the 1980s, and has greatly benefited many coastal regions. Major advances in marine fish culture occurred in the 1990s.

Seaweed culture, which is now a major mariculture industry, was developed in the 1950s as a result of breakthroughs in breeding technology. Hatchery-produced seaweed seedlings are set on rope and cultured on suspended long lines, which are also used for the culture of kelp, scallops, abalone, mussel and oysters. In China, these long lines often cover most of the bays or stretch for large distances along the coast.

Flounder, sea bream, mullet, and puffer fish are some of the marine fish cultured in China. Land-based intensive systems and floating net cages are common, and large shrimp ponds are also used for fish culture.

## History of whaling

Whaling started in the first few centuries of the first millennium BC by the Japanese, and between about 800 and 1000 AD by the Norwegians and by the Basque people living in France and Spain. The Dutch, British and Americans developed whaling in the seventeenth century.

Whaling involved approaching a whale in small boats and driving flint-tipped spears attached to sealskin floats into the animal. Each time the whale rose to blow, more spears were driven into its body until it was so exhausted by the struggle to force its body down against the buoyant drag of many floats that it ceased submerging. Remaining on the surface, the weakened whale could be killed more easily.[3]

Entire canoe fleets of Pacific Coast Indians hunted by driving many spears into the whale when it came up for air. When the assaulted whale finally died, it sank, but within a day or so, the gases emitted from the decomposition process would cause the carcass to float to the surface, at which point it could be towed ashore.

Most of the whalers hunted the slow and docile northern right whale. The whales were sought for their oil and baleen (whalebone). The Japanese ate the meat and found uses for many other parts of the whale. A species related to the right and bowhead whale was hunted to extinction in the Atlantic Ocean.

The American whalers also hunted the sperm whale, first in the Atlantic from New England ports and later in the Pacific from bases in Hawaii. Sperm whales feed on giant squid deep in the ocean, including species that have never been seen alive.

The baleen whale known as the California grey whale was hunted in the lagoons of Baja California, where they breed, and from 16 shore stations along the California coast. It sucks mud from the ocean bottom through one side of the mouth and filters crustaceans called amphipods from the mud using short baleen plates. Hunted to near extinction in the late 1800s, the California grey whale recovered only to once again be threatened with extinction in the 1930s and 1940s by factory ships. Today the species is up to pre-exploitation levels (about 26,000) and has been removed from the endangered species list (Plate 86).

## Development of ground fishing in New England

For over 400 years, the New England fishing industry has been associated both economically and culturally with ground fishing for such bottom-dwelling species as cod, haddock, redfish and flounder.[4]

The Industrial Revolution caught up with the fishing industry around the beginning of the twentieth century. The introduction of the steam-powered trawler from England heralded a major change in the way ground fish were caught, and rapidly replaced the schooner fleets. At the time, there was concern that the powerful new technology would threaten the productivity of the stocks. Scientific investigations of the time warned that the new technology should be applied with care.

By 1930, the fleet had grown too efficient in relation to the stocks' capacity to sustain growth. A new round of scientific investigation begun in 1930 at Harvard University revealed the consequences of the new technology.

Prior to the Second World War, the fleet was large, but profitability was low. Consumption of fish in America had nose-dived as the descendants of immigrants abandoned Old World traditions of fish consumption. With the outbreak of war, the fleet was further reduced as many of the largest trawlers were requisitioned for war duty as mine sweepers. When these vessels returned from war, the industry continued to suffer owing to a continued reduced demand for seafood. Fortunately, the development of new marketing strategies, such as selling ocean perch in the Midwest as a substitute for Great Lakes yellow perch, sustained the offshore fleet.

The beginning of the 1960s saw the development of the most serious threat yet to the sustainability of the fishery. Ocean-going fish factories of the distant water fleets began depleting the cod, haddock, hake and herring resources of the once-rich Georges Bank fishing ground extending from New England to Newfoundland. Soon fleets from East Germany, Poland, Spain, Japan and others joined those from the Soviet Union. Not until the early 1970s could an international commission settle on fishing restrictions, too late to avoid the virtual collapse of most ground fish stocks. There was much pressure particularly from the fishing industry to establish American jurisdiction over a 320 km fishing limit. Congress enacted the Magnuson Act of 1976, taking control of the Exclusive Economic Zone (EEZ) and setting up a system of regulation of the domestic industry. Fuelled by great expectations and aided by subsidy programmes in place since the 1950s, the United States began to build new, modern fishing boats. The fleet, once dominated by wooden side-trawlers, was quickly replaced with steel stern-trawlers, miniature versions of the factory trawlers used by the distant water fleets.

Now the cry for regulation comes not just from the fishermen, but also from environmental groups, the general public and elected officials. Years of supporting industry growth have left the federal government vulnerable to charges that its policies helped collapse the fish stocks and harmed the environment.

## Period synopses

Following the New England example, the history of twentieth-century ground fishing can be divided into six time periods, based on a combination of factors including technological development, changes in species abundance, development of markets for new species, or improved marketing of existing fishes, and major changes in the regulatory regime. Some of these factors relate to more than one time period, whereas others were isolated events

that so greatly dominated the scene that they clearly marked new eras.

### 1. Sail to steam (1900–1920)

Prior to the introduction of steam trawling in 1906, ground fish were caught exclusively with baited lines, fished from schooners and their dories. Owing to the length of their journeys and the lack of refrigeration and freezing, most of the cod catch was salted at sea.

### 2. Cod to haddock (1920–1930)

Along with the transition from schooners to trawlers, the targets of the fishery changed as well. Developments in cold storage, marketing and distribution allowed fresh fish to be available in areas far from the fishing ports. Rather than salt cod, the industry switched to haddock. Landings of haddock shot up rapidly as demand grew. This period witnessed the development of the fresh fish industry and the consequences of the shift in target species to the utilization of the ground fish resource.

### 3. Fishing troubles (1930–1960)

The sudden rise in popularity of haddock resulted in early signs of stress in the stocks, and landings plummeted. Scientists were asked to study causes of the drop in landings and to recommend conservation measures. Biologists of the period recommended increasing net mesh sizes. Profitability of the fishing industry declined significantly through the Great Depression. The outbreak of the Second World War resulted in prosperity as wartime protein demands increased, while there was a shortage of large fishing vessels owing to the conscription of a large part of the fleet for military activities. After the war, lower demand and more vessels resulted in very low profitability.

### 4. Distant water fleets (1960–1976)

The presence of distant water fleets was universally denounced by the domestic industry, especially off the coast of the United States. The industry supported research showing the harmful effects of over-exploitation. At this time, both the American and Canadian fishing industries and scientists were united against the non-North American factions to protect local interests. But the Magnuson Act contained provisions more sweeping than just curtailing international fishing; it also stipulated for the first time that United States fisheries would be managed for maximum benefits to society.

### 5. The Second Industrial Revolution (1977–1984)

Following the passage of the Magnuson Act, there was great optimism in the fishing industry. New modern vessels were constructed, some using financing available at low rates through existing government loan programmes. The Canadians also had extended their territorial jurisdiction 320 km seaward, excluding United States vessels, which had fished off the Scotian Shelf and the southern Grand Banks for generations. In 1979, a draft treaty on reciprocal fishing rights was agreed to at the ministerial level. The treaty recognized historical fisheries by the United States off Canada, and vice versa. However, with the change in administration in 1980, and opposition from some sections of the industry, the draft treaty was not approved.

## FISHING AND MARICULTURE PRACTICES

Salmon aquaculture is now undertaken in two main ways: freshwater rearing and sea-cage rearing.[5] Both methods involve first collecting eggs and milt from captive brood stock, incubating the fertilized eggs in a freshwater hatchery (usually at 10–12 °C), and rearing the newly hatched fry for an additional 6–12 months. In freshwater and sea-cage operations, the young fish (or smolt) are then transferred to larger cages or ponds, where they are reared for the remainder of their lives. Fish remain in captivity for two to three years, and are typically harvested at weights of between 2 and 4 kg.

In ocean ranching, large numbers of smolts are released to sea to fend for themselves before reaching adulthood, then rely on their legendary homing ability to guide them back to their point of release to be harvested. Many companies attempted this potentially efficient style of farming during the 1980s, but abandoned it when marine survival rates proved too low and inconsistent to sustain a commercially viable return.

### Handlining and jigging

Handlining and jigging are two of the oldest forms of fishing and are still common;[6] indeed, single-line methods are still used by many inshore fishermen on the Atlantic Coast. Handlining utilizes a line to which a weight and baited hook is attached. Jigging operations involve the use of lure-like hooks attached to a line, which is 'jigged', or moved up and down in a series of short movements in the water at a level where fish are present. The motion attracts the fish, which are hooked as they go for the lure. The line is then hauled onboard and the fish removed. Handlining and jigging are mainly used to catch ground fish, although pelagic organisms and other species are sometimes caught.

Jigging machines have recently become widely used for catching ground fish and squid. These machines work on the same principle as jigging by hand but are made less labour intensive by the use of electric or hydraulic motors, which automatically move the line up and down in a jigging motion and retrieve the line when fish are hooked.

### Longlining

Longlining, as the name implies, involves the use of a 'longline' with a series of baited hooks spread along the ocean floor. Initially practised manually, this method has now become mechanized and uses automatic hauling, baiting and shooting machines. These improvements have made longlining an increasingly popular form of fishing, for it enables fishermen be more selective, yields a higher quality of fish, and also require less fuel. Longlining is practised primarily in the Atlantic provinces to catch ground fish such as hake, haddock and halibut.

## Bluefin tuna fishing

Bluefin tuna are caught in both commercial and sport fisheries. Bluefins are primarily a by-catch for fishermen engaged in operations such as mackerel trapping. When captured alive, the tuna are placed in corral-like pens and fed mackerel and other fish until a desired weight and fat content is reached, in preparation for sale. Fishing for bluefins is also conducted in big-game style, employing rod and reel manipulated by a fisherman strapped to a chair fixed to the rear deck. Fishing line of breaking strength no greater than 60 kg is required.

## Gillnetting

Gillnets are used on the Atlantic coast to catch many species of fish, especially ground fish and pelagic organisms and such anadromous species as salmon, smelt and gaspereau. They are principally made of monofilament netting and may be either secured to the bottom of the sea with the use of weights or left to drift. Fish are caught as they attempt to swim through the webbing, entangling their gills. Nets are anchored to the seabed to keep the gear stationary and the buoys that float on each end indicate the location, the owner of the gear, and provide a line from which the gear can be raised to the surface to harvest the catch. The nets may be positioned in varying depths, depending on the location of the species. It is common for fishermen to attach a number of nets to increase the efficiency of the operation. The size of the mesh used in gillnets differs depending on the species and size of the fish sought.

## Weir fishing

The weir method of fishing is used in the Bay of Fundy, where the extraordinary height of the tides prevents the use of other types of traps. Weirs are also used on both sides of the St Lawrence River in Quebec. Rigid poles are driven into the mud bottom in a heart-shaped configuration. A straight line of poles is then placed from the shoreline to the weir. This line acts as a barrier to the fish, which follow it into the weir. Once inside, they become disoriented and swim in circles.

## Cod traps

Practised primarily in Newfoundland, cod trap fishing is similar to weir fishing. The traps resemble open-topped box nets, with a perimeter of 11–22 metres and a vertical opening or 'door' on one side. The trap is set on the ocean bottom, usually close to the shore, with the door facing shallow water. It is buoyed on the top and anchored on each corner to maintain its position. A long net fence or 'leader' extends from shallow water into the mouth of the trap. When the cod, feeding on fish such as capelin along the seashore, confront the leader, they instinctively shift direction, swimming through the open doors into the trap. Once inside, they tend to swim in circles, trying to avoid the leader, and so fail to locate the doors.

## Offshore lobster traps

Offshore lobster traps are constructed of metal or heavy wooden frames covered with wire mesh, and are considerably larger and sturdier than inshore traps. Vessels of the offshore fleet measure between 18 and 34 metres in length and are based in southwestern Nova Scotia. These offshore vessels are not permitted to harvest lobster closer than 80 kilometres from shore.

## Inshore lobster fishing

Inshore lobster fishing is practised by inshore fishermen using traps set on the ocean floor, either individually or in groups on a line. The size and design of these traps differ somewhat in various localities, but they are usually constructed of curved pieces of wood, laths, and cotton or nylon twine, and often weigh in excess of 40 kg. Every trap has one or more funnel-shaped openings fashioned from twine, which allow the lobster to enter the trap but prevent it from escaping. They are baited with either fresh or salted fish, commonly herring, and mackerel. Traps are set in waters of varying depths, but usually near the rocky bottoms preferred by lobsters. In recent years, fishermen have begun to make greater use of electronic equipment to determine water depth and bottom type. Traps are ballasted with flat stones or concrete slabs to sink them and reduce their movement on the ocean floor. Marked buoys allow the gear to be easily located and identified. The traps are hauled up on the boats using winches. Smaller, illegal-sized lobsters are returned to the water along with any unwanted species. The harvested lobsters are kept alive in boxes or tanks containing circulating water.

## Crab traps

Crab traps differ considerably from those used in the lobster fishery. They are framed with iron rods, covered with polyethylene rope webbing and may be either cone-shaped or rectangular. Crab traps are much more expensive than lobster traps because of the material used, and are somewhat larger. Usually only one trap is placed on each line. While the main species caught in the Atlantic area is the snow crab, exploratory fishing is being conducted for rock crab, Jonah crab and red crab.

## Purse seining

A seine is a wall of webbing used to encircle fish. Its effectiveness in catching fish results from its encircling action, rather than towing. As with the gillnet, the purse seine has floats on the top and weights on the bottom to maintain its vertical position in the water. A purse seine, however, has a wire rope passing through rings on the bottom of the net, thereby enabling the net to be drawn together to entrap fish. While purse seines are used to catch many species of fish, they are most effective when used to capture fish schooling near the ocean bottom. When a school of fish is detected, one end of the seine is taken by a small boat or 'skiff'. The vessel and skiff then encircle the fish with the net. After receiving the end of the line from the

skiff, the vessel begins to winch in the wire cable, closing the bottom of the seine and forming a bag-like net around the fish. The other lines are then also winched in, reducing the space inside the net, which is then brought alongside the vessel. The fish are dipped out and put in penned-off sections, boxes, or in the hold of the vessel.

### Eel traps

The principal commercial device used to harvest eels is the flume or 'hoop net.' The name comes from the hoop used to frame the net. The hoops are set in rivers, trapping the eels as they move in. A leader set in front of the net directs the eels into the funnel-shaped sections of the trap, from which they cannot easily escape.

### Canadian pair

Canadian pair seining is a recently developed method of fishing used by relatively few fishermen. Two vessels sweep an area of smooth seabed with cables and ropes, corralling fish into a net, and winching the net in. The net resembles an otter trawl net with a much wider vertical opening. It is set and hauled by the two vessels, which maintain coordinated positions through regular radio contact. The success of the operation relies on the 'heading' effect of the 'warps' or cables. When the vessels come together, the cables are brought together, and the net is winched in from both boats.

### Otter trawling

Otter trawls are cone-shaped nets towed along the ocean bottom to catch many species of ground fish. They take their name from the rectangular doors, or 'otterboards', attached to cables between the boat and the net. These doors keep the mouth of the net open horizontally while the net is making its tow. A vertical opening is maintained by the combined effect of the weights on the bottom, the floats on the top and the water pressure generated from the towing. The net traps fish in the end of the bag-like section or 'cod-end', which has a mesh size that permits only the smaller fish to escape. The net rolls along close to the bottom with the aid of bobbins, which are similar in appearance to wheels. After a period of towing, the trawl is winched up beside the vessel. In a side trawling operation, the cod-end is raised and suspended over the vessel. The cod-end is untied, and the catch released onto the vessel's deck, where the fish are bled, gutted and stored in the hold. In a stern trawling operation, the gear is hauled up the 'stern ramp' and the cod-end opened.

### Mid-water trawling

Mid-water trawls can be used to catch many species of fish, most commonly herring, mackerel, redfish, pollock, capeline and shrimp. Mid-water trawls resemble otter trawls in that they are cone-shaped and constructed of webbing. Unlike otter trawls, however, they have fewer weights, and thus can be adjusted for towing at various depths. This adjustment is made by increasing the vessel's speed or by varying the length of the cable or 'warp' between the vessel and the net.

### Atlantic side trawling

Atlantic side trawlers belong to the older series of ground fish trawlers, which are declining in numbers due to the preference for more modern stern trawlers. They are referred to as side trawlers since the gear (trawl) is towed from gallows attached to one side of the vessel.

### Stern trawling

Stern trawlers are the main components of Canada's Atlantic offshore fishing fleet and are modern vessels of steel construction, averaging in size from 30–50 m. Atlantic stern trawlers harvest traditional ground fish species such as cod, haddock, flounder and hake. The gear (trawl) is hauled into the vessel over a large ramp through an opening at the back or 'stern' of the ship. Stern trawlers can operate in almost any waters or weather conditions and often range as far as 450 km off the Canadian east coast, fishing at depths of up to 100 m. These vessels can contain up to 2.7 tonnes of fish within their holds. They carry a crew of about 15 and can fish for 10 days to two weeks each trip.

### Oyster tonging

Tonging is the main method used to harvest oysters. It is used on natural oyster beds and small leased areas where regulations prevent the use of other equipment. Tongs consist of a pair of rakes attached to long, wooden scissor-like handles. The handles are joined together approximately one-third of the way from the end of the rakes. The teeth of the rakes point inward, and some tongs have baskets attached on both ends. The handles vary from three to eight metres in length. With a series of short lifting movements, the oysters are scraped off the bottom and gathered up into the boat. The vessels used in the operation are usually small because of their versatility. Harvesting oysters with tongs is a very time-consuming operation because tongs can be used only when the water is calm, and tongs are inefficient in water over five meters deep.

One of the new scientific methods applied to mariculture to increase production is marine biotechnology.[7] This term encompasses any scientific investigation that focuses on marine organisms and utilizes new cell, protein and nucleic acid technologies such as recombinant DNA (rDNA), protein engineering, DNA hybridization, etc. Biotechnology techniques are included under the rubric of marine biotechnology if they are used in certain applied fields like aquaculture, fisheries and natural marine products.

### EFFECTS OF OCEAN FISHING AND MARICULTURE ON THE ENVIRONMENT

Mariculture has two effects on the coastal environment:[8] some types of mariculture improve the coastal environment and increase food supply, while others deplete wild fisheries

stocks and damage the coastal environment. According to the driving factors of systems, aquaculture ecosystems can be divided into two groups: autotrophic or natural trophic systems such as kelp culture systems and raft culture systems for scallops, which obtain energy from solar radiation and nutrients from water; and heterotrophic or artificial trophic systems, such as net culture systems for feeding fish and pond culture systems for shrimp, which obtain energy mainly from artificial feeds. There are many features of ecological mutual compensation between the two types of aquaculture systems. For example, in China, most mariculture production is produced from autotrophic systems. However, we should not neglect the negative effects of some types of mariculture on the coastal environment in our aim to achieve sustainable mariculture. Some of these are as follows.

## The spread of antibiotics

Antibiotics and other therapeutic chemicals added to feeds can affect organisms for which they were not intended when the drugs are released as the uneaten pellets decompose.[9] Nonetheless, many drugs used in fish farms have been found to have minimal (if any) deleterious effects on the aquatic environment. Feed additives, however, are not the only source of potentially toxic compounds in culture operations. A variety of chemicals are used to inhibit the growth of organisms.

## The aquaculture effluent: pollution of inland and coastal waters

Although a link between fish farming and the decline of natural stocks cannot always be established, some environmental effects are clear. Unlike mollusc farming, many species of fish depend on a diet of artificial feed in pellet form. This feed is spread onto the surface of the water and consumed by the fish as it settles through the water column. Because not all the feed is eaten, a great deal of feed can reach the bottom where it is decomposed by micro-organisms. This alteration of the natural food web structure can significantly impact the local environment.

## Eutrophication

An increasingly significant effect of intensive fish culture is eutrophication (increase of mineral and organic nutrients in a water body, thus reducing dissolved oxygen and producing an environment that favours plants over animals) of the water surrounding rearing pens or the rivers receiving aquaculture effluent. Fish excretion and faecal wastes combine with nutrients released from the breakdown of excess feed to raise nutrient levels well above normal, creating an ideal environment for the formation of algal blooms. To compound the problem, most feed is formulated to contain more nutrients than necessary for most applications. In Scotland, for example, an estimated 50,000 tonnes of untreated and contaminated waste generated from cage salmon farming goes directly into the sea, equivalent to the sewage waste of a population of up to three-quarters of Scotland's population. Once the resulting algal blooms die, they settle to the bottom where their decomposition depletes the oxygen. Before they die, however, there is the possibility that algal toxins are produced.

## The effect of intensive fish rearing

The method of intensive fish rearing in dense, cage farms in protected marine areas has an environmental price attached. Uneaten fish food, together with the fish excretions, may accumulate on the seafloor under the cages, in conditions of low water exchange. This accumulation may have a negative effect on the marine environment. The organic matter, as it accumulates, may undergo biochemical and microbial changes. High levels of hydrogen sulphide may be produced in the marine substrates, followed by deterioration in the oxygen level of this environment. These changes can cause the death of immovable organisms and repel mobile forms of life from the damaged habitat.

## The effect of sedimentation

The structures used during cultivation processes can cause environmental change.[10] For example, the use of netting to protect clams from crab predators leads to siltation and accumulation of sediment. Parks of trestles can drastically alter the water flow regime leading to changes in sedimentation rate and oxygen exchange within the system. Extensive intertidal cultivation plots could deprive birds of feeding habitats, and the associated husbandry practices may disturb roosting birds.

The final stage of cultivation involves harvesting. In many cases, this entails little more than emptying the bivalves from lifting ropes. However, in the case of species cultivated within sediment, or relayed on the seabed, the use of intrusive techniques is required. Both dredgers and suction devices cause disruption of the sediment and kill or directly remove non-target species.

## Marine animal health

Bacterial, fungal, protozoan and viral infectious diseases are widespread among natural fish populations. Animals raised in aquaculture are especially vulnerable to damage by disease. Polluted waters favour the development of fungal diseases, the most common agent being *Saprolegnia*. There are also positive aspects to coastal shellfish cultivation, such as the provision of hard substrata and shelter in otherwise barren sites and the possibilities of using the cultured organisms as environmental sentinels or guards.

## CONCLUSION

Our knowledge of the oceans has been progressively enriched by the development of oceanographic research during the last century. The potential of mariculture has been mapped out and characterized by modern techniques. Scientific and technical methods, which may vary according to the region, have been developed and applied to harness and exploit marine culture commercially. Humankind now

realizes that the ocean is a source of food if properly maintained and utilized. Fish farming has yet to reach its maximum potential. Large areas of our planet remain to be developed into highly productive marine farms. However, advances in the technological exploitation of mariculture generate threats to the environment, and we must work to combat them.

## NOTES

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# 17.4

# ELECTRONICS

*Eriabu Lugujjo*

## THE ELECTRONIC AGE – EARLY RESEARCH AND DEVELOPMENT

By the turn of the last century, it was known that electrons existed and that many metals would emit electrons if exposed to radiation. However, no electron device based on this phenomenon existed. The Fleming Diode, introduced in 1904, is usually considered to be the prototype electron device. This diode had two electrodes – one a thin filament of wire (the cathode) and the other a metal plate (the anode). The cathode could be heated by an electric current and the electrodes were enclosed in an evacuated glass envelope. The diode acted as an electrical conductor when the anode was kept at a positive potential with respect to the cathode. Upon radiation the electrons emitted by the cathode were captured by the positive anode, thus forming a current flow. When the polarity was reversed, there was no current flow and the diode acted as an insulator. This non-linear behaviour was eventually exploited in the development and perfection of other electron devices.

In 1906 and 1907, De Forest invented what is now called a 'triode'. He put a third electrode in the form of a wire grid between the cathode and anode of the diode. In this arrangement of three electrodes, the current flowing to any electrode depends on the potential of all three electrodes. It is interesting to note also that under certain circumstances the grid potential acts as an effective control of the current to the anode without taking much itself. The triode thus became a practical way of transmitting radio waves and contributed significantly to the growth of radio broadcasting.

After the discovery of the triode, other multi-electrode valves with four, five and more electrodes were introduced. Of course, these new electrodes gave additional advantages of various kinds. However, their operation depended on their non-linearity or the amplifying property of the grid. It should be emphasized that diodes worked under space-charge conditions

At high temperatures the rate of emission of electrons from the cathode is so large that the potential in the vicinity of the cathode is lower than that of the cathode. For an electron to reach the positive electrode (anode), it must

have energy in electron volts greater than the amount of the potential depression. What this means in practice is that electrons emitted from the cathode have a distribution of velocities. Electrons with insufficient energy to surmount the potential barrier are returned to the cathode. As the temperature increases the emitted number of electrons increases – and a negative potential region surrounds the cathode. More electrons are repelled by this negative region. At higher temperatures, the fraction of electrons overcoming the potential barrier decreases in such a way that the net current reaching the anode does not change appreciably. Operation under these conditions is classified as space-charge-limited. Indeed diodes are operated in this region.

After triodes, other multi-electrode devices were discovered, such as tetrodes. The tetrode was improved by addition of a third or suppressor grid between the screen grid and the anode. The resulting five-electrode tube was named the pentode.

From roughly 1907 to 1912, radiotelephony developed slowly in Europe. However in 1915, the engineers of the American Telephone and Telegraph Company succeeded in talking by radio from the huge naval station at Arlington, Virginia, to Paris (France) and, in the opposite direction, to Honolulu. This great experimental feat was accomplished by using vacuum tubes as oscillators and voice amplifiers.

The years 1921–23 marked the beginning and organization of broadcast radiotelephone, a service for subscribers to listen to scheduled programmes of music, lectures, news bulletins, educational and entertainment content.

By the 1920s, diodes were already operating in X-ray tubes and for rectification purposes. Indeed there were triodes for amplification, oscillation, switching and counting. Multi-electrode tubes were developed for the same uses above, but in a more refined form.

Other types of vacuum valves that work on the principle of secondary emission were developed. These included electron multipliers and photo-multipliers. Photo-multipliers working on the principle of photoemission were discovered and used for measuring and amplifying light. Then followed photocells, which are still used for light

measurement and control. The emission of electrons from the cathode requires additional energy. In thermionic emission – the emission of electrons into a vacuum – extra energy is given to the electrons by heating the cathode. Energy may also be supplied as radiation, when photoemission occurs. Finally, the electrons may be knocked out of the cathode by impact with other fast electrons or ions. This is called *secondary emission*.

Another important development was the introduction of gas tubes. In this case conduction electrons are produced by using radiation or fast particles to ionize gas atoms. These tubes include diodes, triodes and tetrodes. An example of such devices is the thyratron. This is a gas-filled triode with a thermionically heated cathode. The period 1920–30 saw the development of devices that control the movement of electron beams between electrodes with both steady and alternative fields. Klystrons and magnetrons were developed on this principle. These are special valves used at the higher frequencies. The klystron is very useful in the conversion of direct current (DC) to alternating current (AC). Magnetrons are vacuum-tube devices that generate or amplify high-frequency electromagnetic waves.

The years 1920–30 also marked the beginning of quantum mechanics, for which numerous important applications were found in other areas in the years to come. By 1927 the basic concepts of the new quantum theory had been ironed out, thus providing physicists of the time with powerful tools to describe electronic and atomic systems and to explain the cohesion of atoms in solid crystals.

By 1931, Wilson had developed a theoretical model of quantum mechanics that related what had been learned about the motion of electrons in metals and also provided a fair explanation of insulators and semiconductors. The 1931 publication of Wilson's theoretical model of solid-state semiconductors coincided with an increasing interest in semiconductors for use in electrical communications. Indeed, tubes had been in circulation and upgraded over the years. However they were not useful for the short wavelengths being studied in the 1930s, and thus the rectifying properties (converting an alternating current into a direct current) of semiconductors attracted great attention. One drawback was that the implications of Wilson's theory were not very clear to the research workers of the time, as it had been described in wave-mechanical terms.

It was not easy to perform any experiments on semiconductors. For example, there had been uncertainty whether the non-ohmic behaviour of a contact between a metal and a semiconductor was a property of the semiconductor alone – a 'volume property' – or of the contact between it and the metal – a 'surface property'. It was a real brain teaser for anybody to examine experimentally the electrical properties of a semiconductor without making contact with it. Fortunately, by 1935, a series of experiments had made it clear that the non-ohmic property belongs to the contact, not to the semiconductor itself.

When research on such questions reappeared after the war (1945), it was directed at an understanding of silicon and its neighbour germanium. Silicon and germanium are single chemical elements, falling successively below carbon in Group IV of the periodic table. They crystallize with a simple atomic arrangement. The atoms in these crystals are bound together by pure covalent bonds. Silicon and germanium are indeed prototypes – 'ideal' semiconductors. Their conductivities are intermediate between those of insulators and metals. However their conductivity is electronic, like that of metals.

## THE TRANSISTOR REVOLUTION AND ITS OFF-SHOOTS

In the late 1930s, a young physicist at Bell Laboratories named William B. Shockley became interested in the possibility of developing a solid-state device of some kind to provide an electronic substitute for electrochemical switches that were universally used in telephone exchanges to connect one telephone with another.[1] He and others believed that electronic telephone switching would eventually be needed and that vacuum tubes would probably be too costly and unreliable for the task.

Shockley saw promise in a theory that had been proposed by Walter Schottky in studies of rectification at the interface between a metal and a semiconductor. Shockley foresaw the possibility of an amplifying action in the region between the metal and the semiconductor. He believed that the region between the two structures (metal and semiconductor) would constitute a kind of valve action. In 1939, he tried building valve-like devices with a combination of copper oxide, but he was unsuccessful.

After the Second World War, Shockley returned to Bell Laboratories. He and Gerald L. Pearson observed field-effect behaviour in 1948 with the structure of silicon called p-n junction. In the same year, John Bardeen and Walter Brattain announced the development of a point-contact transistor. A year later William Shockley published a classic paper on junction diodes and transistors. The three scientists were awarded a Nobel Prize in 1956 for discovering the junction transistor. In 1952, Shockley published the theory of the field-effect transistors, and a practical form of the device was built by George C. Dacey and Ian M. Ross in 1953. This device used an electric field to control conduction in a germanium semiconductor structure.

In 1950, the first prototype of a junction transistor was constructed. The first practical alloy junction transistor that provided a more economical manufacturing process came on the market the following year, in 1951. The surface barrier transistor of 1953 pushed the frequency range into the MHz region. The diffused base transistor unveiled in 1955 provided outstanding high-frequency performance. The first monolithic integrated circuit was built in 1958 by Jack St. Clair Kilby, but it was not until 1961 that process and design advances made such circuits commercially viable.

### Electronics and solid-state engineering

With the advent of transistors and research on semiconductors, it seemed possible to imagine a solid electronic block with no connecting wire. The block had to consist of layers of insulating, conducting, rectifying and amplifying materials, the electrical functions being connected directly by cutting out areas from the various layers.

Figure 1 shows the transistor family and the first integrated transistor of Resistor-Transistor Logic (RTL) and Diode Transistor Logic (DTL).

*Figure 1* **Transistor family history**
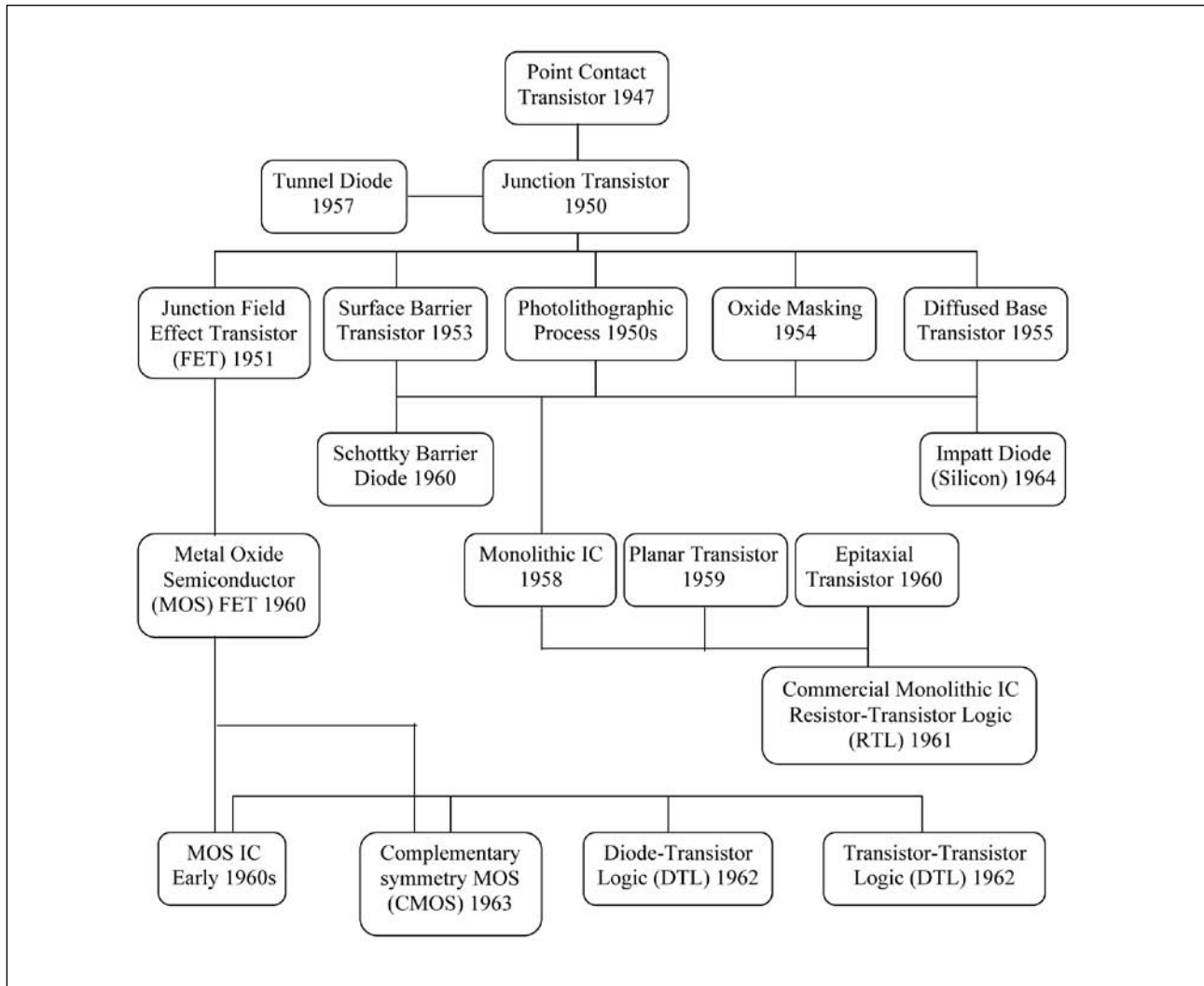
The invention of transistors was a radically new departure in electronics. But before it could be universally accepted as the new basis for electronic circuitry, it was necessary to develop new circuit theories, new engineering and technical processes, and to establish new facilities for large-volume production. There was therefore a gradual acceptance and penetration of solid-state electronics in the market place and society at large.

In 1952, the junction transistor was four years old, the Korean War was at its height and both the military and large corporations were emphasizing the need for greater reliability from existing components. The United States Armed Forces was already considering what it loosely called miniaturization or even micro-miniaturization.

**Large-scale integration and miniaturization**

Large-scale integration, which entails combining thousands of circuit elements on a single chip, was prompted by various missile and satellite programmes that called for complex electronic systems to be installed in equipment in which

size, weight and power requirements were serious constraints. This revelation was timely because by the mid-1950s engineers had learned how to define the surface configuration of transistors by means of photolithography and developed the method of solid-state diffusion for introducing the impurities that create the p and n regions. In fact, by this time batch processing of many transistors on a thin piece of silicon and germanium (wafer) sliced from a large crystal of germanium/silicon had begun to displace the earlier technique of processing individual transistors.

In the integrated circuit, the separation and interconnection of transistors and other circuit elements is accomplished electrically rather than physically. The separation is achieved by introducing p-n diodes (rectifiers), which allow current to flow in only one direction. A conducting film of evaporated metal that is photoengraved to leave the appropriate pattern of connections interconnects the circuit elements. An insulating layer is required to separate the underlying semiconductor material from the metal film except where contact is desired. In 1958, researchers at Fairchild Semiconductors discovered the process that accomplishes this insulation when they

invented the planar transistor. In this transistor, a thin layer of silicon dioxide, which is the best insulator known, is formed on the surface of the wafer.

Large-scale integration, which is a basis for microelectronics, enables instruments not only to make measurements but also to analyse them. Over the past twenty years, complex and powerful measuring instruments and control devices have been designed and put on the market for the service of humankind. The use of microprocessor and digital technology has rapidly evolved and reading/testing errors have been minimized. Modern information processing and control systems call for the rapid storage and retrieval of digital information. The amount of information to be stored ranges from fewer than several hundred bits for a pocket calculator to a trillion bits for a large computer.

## ELECTRONICS AND SOME OF ITS DIVERSE APPLICATIONS

Early applications of electronics in the 1920s centred mainly on radio communications, rocketry, telephone, radar and the use of vacuum tubes in research and utility instruments. At that time, components were discrete in nature. Today, with the advent of solid-state electronics and miniaturization, electronics has become a 'global culture' that has permeated every sector of our society.

Developed countries are increasingly spending heavily on semiconductor electronics. Fields enjoying hefty budgets include computers, consumer electronics, solid state, communications, power generation, industrial electronics, military and aerospace, medical diagnostics, railroads, industrial electronics, and basic research. Table 6 illustrates

*Table 6* **Five generations of computers**

| Generation | First | Second | Third | Fourth | Fifth |
|---|---|---|---|---|---|
| Years | 1946–1956 | 1957–1963 | 1964–1981 | 1982–1989 | 1990 – |
| **Example** Computers | Eniac Edvac Univac IBM 650 | NCR 501 IBM 7094 CDC-6600 | IBM 360, 370 PDP-11 Spectra-70 Honeywell 200 Cray 1 IIIiac-IV Cyber-205 | Cray XMP IBM 308 Amdahi 580 | – Extensive development of distributed computing<br><br>– Merging of telecommunications and computer technologies<br><br>– Extensive modularity |
| Telecom-munications technology | Telephone Teletype | Digital transmission Pulse-Code Modulation | Satellite communications Microwaves Networking Optical fibres Packet switching | Integrated systems digital network (ISDN) | |
| Computer hardware | Vacuum tubes Magnetic drum Cathode ray tubes | Transistors Magnetic-ore memories | ICs Semiconductor memories Magnet disks Minicomputers Microcomputers | Distributed computing systems VLSI Bubble memories Optical disks Microcomputers | – Advanced packaging and interconnection techniques Ultra-large-scale integration – Parallel architectures, 3-D integrated-circuit design – Gallium arsenide technology-Josephson junction Technology-Optical components |
| Computer software | Stored programs Machine code Autocode | High-level languages Cobol Algol Fortran | High-level languages Pascal operating systems Structured programming | Ada Widespread packaged programs Expert systems Object-oriented languages | – Concurrent languages, Functional programming, Symbolic processing (natural languages, vision, speech recognition, planning) |
| | | | Timesharing LISP Computer graphics | | |
| Computer performance | 2-kilobyte memory 10 kilo-instructions per second | 32-kilobyte memory 200KIPS | 2-megabyte memory 5 mega-instructions per second | 8-megabyte memory 30 MIPS | 1 giga-instruction per second 1 tetra-instruction per second |

*Source:* Kahn, 1983.

the different generations of computers since the end of the Second World War.

Countries like Japan and the United States, in particular, are continuing to develop circuits and systems based on Very Large Scale Integration (VLSI), with the aim of competing favourably in world markets, but at the same time producing reliable products.

## ELECTRONICS, SOCIETY AND INDUSTRY

The electronics industry has been heavily influenced by research, development and demands in developed countries. Up to the early 1970s, manufacturing of electronics was largely concentrated in Europe and North America. However, because of competition and profit-making incentives, the electronics industry has also been spreading into the developing world over the last twenty-five years.

Exports of electronic products from Taiwan, Hong Kong, Singapore, Republic of Korea, Malaysia and Mexico constitute multibillion-dollar-a-year industries. In each of these countries production has emerged and grown in response to external demand, and the industry is almost entirely export-oriented.

Electronics manufacturers in Japan and the United States have played the role of primary financiers by establishing their own production subsidiaries, or by subcontracting with independent firms whose production costs are low. Finished products carry the name and labels of these backers. During the past twenty years or so, multinationals have transplanted their production activities exclusively to developing countries in Asia, Central America and South America. The main and basic motivation has been the quest for lower production costs and abundant, trainable labour. All those products that require labour-intensive inputs have been relocated to developing countries. Also, countries with some developed transport and communication, appropriate educational facilities, and a large, disciplined and highly motivated labour force have attracted multi-national electronic industries. With respect to China, there was a lag in the electronics industry due to the Cultural Revolution of 1966. By 1978, China was about 15 years behind the United States and Japan in the area of integrated circuits, telecommunications, automobile engineering, and computers and data communications.

Establishing an electronics industry in Africa is quite possible and would be cost-competitive with Asian electronics manufacturers if tariffs on imported components and materials were exempted and European duties on imports of the completed products were eliminated under preferential arrangements. It is true that a number of African countries have privatized their economies, but there is still political uncertainty, high costs for training, undeveloped transport and poor communications infrastructure, all of which discourage investment in the electronics industry.

As far as society is concerned, we should not overlook the major contributions of electronics to human welfare. Among those of major import during the past forty years have been the use of satellites to extend education and health services, ground sensors for peace keeping, microprocessors in the development of generations of computers, improvement in the design of more efficient energy storage

devices and transmission networks. The development of electronics during the last century has been marked by a number of milestones: namely, the discovery of the triode (audion) in 1907 by De Forest, and its utilization in amplification; the discovery of the negative feedback amplifier by Harold Black in 1927, which played a major part in long distance telephone and television networks (Plate 87), military electronics, and industrial applications, and also revolutionized the entire area of control; the discovery of the junction transistor in 1948 by W. Shockley, John Bardeen and Walter Brattain; the development of the concept of integrated circuits by Kilby in 1958; and subsequent manufacturing of ICs, Large Scale Integration (LSI) and Very Large Scale Integration (VLSI) using the planar process.

## CONCLUSION

The last century witnessed a revolutionary transformation of human activities by the electronics industry. This industry has brought a new paradigm to people's thinking and work habits. Instrumentation has opened up new frontiers in research – in medicine, biology, telecommunications, astronomy – all of which have provided new insights in the nature and workings of the Universe.

## NOTE

1.    For the following, see: G. L Pearson and W. H. Brattain, 'History of Semiconductor Research', in: *Proceedings, IRE*, Vol. 43, pp. 1795–1806, 1955.

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# 17.5

## APPLIED ASTRONOMY AND INTERPLANETARY SPACE EXPLORATION

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*Eriabu Lugujjo*

## THE HISTORY OF ASTRONOMY

It is difficult to explain the development of astronomy during the last century without referring to contributions made by the early pioneers. Nicholas Copernicus (1473–1543), for example, spent time observing and making calculations and reached the conclusion that the Earth was just a planet orbiting the Sun. This theory matched all observations and was wonderfully simple – but the Church did not like it. Tycho Brahe (1546–1601), a Danish astronomer, amassed huge amounts of data on planetary motions. Unfortunately for him, he was a believer in the geocentric theory and never looked at his work in another light. Johannes Kepler (1571–1630) started to analyse Tycho's data and realized that it only fit if applied within the Copernican (heliocentric) theory. In 1609, he formulated the equations for orbiting planets and satellites. In particular, he determined that the planets move in ellipses rather than circles. Galileo Galilei (1564–1642) made many discoveries but also ran into conflict with the Catholic Church. He used one of the first-ever telescopes to observe the Moon, Venus, the Sun and Jupiter. His downfall came when he published works that agreed with Copernicus' heliocentric theory. He was tried by a religious tribunal and ordered not to publish any books about the Copernican theory. Galileo never recanted, and today we also remember him for his quietly defiant words at the trial: 'It still moves'.

Sir Isaac Newton (1642–1727) worked in many fields, but his chief contribution to astronomy was the discovery of the laws of gravitation. These laws held true for four hundred years until Einstein's theory of relativity. He established the three fundamental laws of force, motion, and gravitation and invented a new branch of mathematics in the process, called calculus. Newton did all this to show how the force of gravity is the reason that planetary orbits follow Kepler's equations. By the late 1800s, scientists were becoming aware of the need to revise the old Newtonian-based physics and develop a new theory. The laws of Newtonian principles were beginning to show their limits; for example, the precession of Mercury's orbit could not be completely accounted for. Albert Einstein (1879–1955) revolutionized all aspects of science and modern thought through his theories of general and special relativity, and the idea of equivalence. However, he was only taken seriously after rigorous testing of his theories. One example is the famous advance of Mercury's perihelion. Because Newton's law did not correctly predict this, Einstein's theory gained approval for a new revolution in science. With this revolution and the space age of the twentieth century, the world could once again boast of having achieved scientific and mathematical progress equal to that of the early Greeks.

## THE EXPLORATION OF SPACE

'The Earth is the cradle of mankind – one cannot remain in the cradle forever'. So said Konstantin Tsiolkovsky, a Russian schoolteacher.

The pioneers of spacecraft design, who worked out almost all theory of space flight over a period of nearly three centuries – from 1600 to 1900 – were Johannes Kepler, Sir Isaac Newton and Konstantin Tsiolkovsky (1857–1935).

Tsiolkovsky was a modest Russian schoolteacher who in 1903, without ever launching a single rocket himself, was the first to figure out all the basic equations for rocketry. He anticipated and solved many of the problems associated with rocket-powered flight and drew up several rocket designs. He determined that liquid fuel rockets would be needed to get to space, and that the rockets would need to be built in stages. He concluded that oxygen and hydrogen would be the best fuels to use.

By contrast with Tsiolkovsky, Robert Goddard (1882–1945) was the man who actually designed, built and flew the rockets. He was a university professor who also developed the theory of rocketry and, although he didn't know about Tsiolkovsky's work, he reached the same conclusions. Goddard conducted practical experiments in rocketry early in the twentieth century. He was interested in achieving higher altitudes than were possible for lighter-than-air balloons, and in 1919 he published a pamphlet entitled *A Method of Reaching Extreme Altitudes*. It was a mathematical analysis of what is today called a meteorological sounding rocket.

In 1926, Goddard launched the world's first liquid-fuelled rocket, and he is widely considered the foremost pioneer of rocket technology. Working independently, he developed the same components and designs that took the Germans hundreds of scientists and engineers and millions of dollars to develop during the Second World War. Goddard's earliest experiments involved solid-propellant rockets. In 1915, he tried to measure the exhaust velocities of the burning gases using various types of solid fuels. While working on solid-propellant rockets, Goddard became convinced that a rocket could best be propelled by liquid fuel. He achieved the first successful flight with a liquid-propellant rocket on 16 March 1926. Fuelled by liquid oxygen and gasoline, the rocket flew for only two and a half seconds, climbed 12.5 metres, and landed 56 metres away.

Goddard's rockets became bigger and flew higher. He developed a gyroscope system for flight control and a payload compartment for scientific instruments. Parachute recovery systems were employed to return rockets and instruments safely.

Hermann Oberth (1894–1989),[1] another great space pioneer from Germany, published a book in 1923 about rocket travel into outer space. Because of the book, many small rocket societies sprang up around the world. In Germany, the formation of one such society, the Verein fur Raumschiffahrt (Society for Space Travel) led to the development of the V-2 rocket, which was used against London during the Second World War. In 1937, German engineers and scientists, including Oberth, assembled in Peenemuende on the shores of the Baltic Sea to work in a rocket research facility built by Hitler.

The V-2 rocket (in Germany called the A-4) was small by comparison to today's rockets. It achieved its great thrust by burning a mixture of liquid oxygen and alcohol at a rate of about one ton every seven seconds. Nevertheless, by the end of the war, German rocket scientists and engineers had already laid plans for advanced missiles capable of spanning the Atlantic Ocean and landing in the United States. With the fall of Germany, the Allies captured many unused V-2 rockets and components, and many German rocket scientists emigrated to the United States and the Soviet Union. Both countries realized the potential of rocketry as a military weapon and began a variety of experimental programmes. At first, the United States launched a programme with high-altitude atmospheric sounding rockets, one of Goddard's early ideas. Later, a variety of medium- and long-range intercontinental ballistic missiles were developed. These became the starting point of the US Space programme. Missiles such as the Redstone, Atlas, and Titan would eventually launch astronauts into space.

## Trends in Space Exploration

Sergei Korolev, earlier known anonymously in the USSR as 'Chief Designer', was inspired by the work and visions of Tsiolkovsky. He informed the Soviet Union Council of Ministers in 1954 that an artificial Earth Satellite could be launched in a few years' time, and he was as good as his word. On 4 October 1957, *Sputnik 1* – the first man-made object to orbit the Earth – was launched by the USSR and remained in orbit until 4 January 1958.

The news that the Soviets had launched *Sputnik 1* hit the Western countries, and in particular the United States, like

a bombshell. As the world watched American rockets explode with embarrassing regularity, the Soviets launched *Sputnik 2* on 3 November 1957. This satellite carried a dog that survived in space for seven days (i.e. until its oxygen was exhausted). The United States succeeded in sending a satellite into orbit on 31 January 1958, thus marking the start of a 'Space Race' essentially to send a person into orbit. These scientific advancements were propelled by a desire for international prestige and national security, and they were a way of demonstrating to the entire world the advantage of a particular political ideology.

The United States was so determined to explore space that, on 1 October 1958, the National Aeronautics and Space Administration (NASA) was created to take over the duties of the National Advisory Committee for Aeronautics (NACA), which was founded in 1915. Within a few days of its creation, NASA initiated Project Mercury, whose stated objective was placing a man in space and returning him safely to Earth. Meanwhile the USSR was making great strides in launching satellites to orbit the Sun, and it succeeded in January 1959 with *Luna 1*. In 1961, it launched *Vostok 1* carrying cosmonaut Yuri A. Gagarin, the first person in space. He completed a single orbit of the Earth (Plate 88).

Meanwhile, NASA was making long-term preparations not only to orbit the Earth but also to explore space, starting with the Moon and on to Mars. In January 1962, *Friendship 7* lifted off with John H. Glenn Jr., who orbited the Earth three times and became the first American in orbit. In the same year, the US *Mariner 2*, the first successful planetary spacecraft, flew past Venus and entered a solar orbit. More was to come from the Soviets, however. In 1963, cosmonaut Valentina Tereshkova, the first woman in space, orbited the Earth forty-eight times in *Vostok 6*.

Both the Soviets and Americans were determined to explore space using manned flights and by landing a person on the moon. Many flights and experiments were made, and the period 1965–69 could be described as experimental, eventful and extremely trying years for both countries. These efforts were rewarded and culminated in the first manned soft lunar landing, by Neil Armstrong and Edwin Aldrin on 20 July 1969, aboard *Apollo 11*. The success of the *Apollo* programme triggered a wave of launches to the Moon, Venus and Mars. The USSR's *Lunar 17* landed on the Moon with the first automatic robot, *Lunokhod 1*, on 17 November 1970. In the same year, the Soviet's *Verena 7* was the first probe to achieve a soft landing on Venus. Ever since then there have been many launches and successes yielding invaluable knowledge about space and the planets. An attempt to sequence these events has been made and is presented in an annex to this section.

## RADIO ASTRONOMY

Radio astronomy deals with the study of distant objects in the universe by collecting and analysing the radio waves they emit. It has been a major factor in revolutionizing our understanding of the universe and how it works. Radio observations have provided a whole new outlook on objects we thought we already knew, such as galaxies, while revealing the existence of other unexpected objects such as pulsars and quasars. Radio telescopes today are among the most powerful tools available for astronomers studying nearly every type of object known in the universe.

## Early radio astronomy

Following Marconi's successful transatlantic communications in 1901, commercial use of radio mushroomed. It was thought that the only useful frequencies for long-range communication were the very low frequencies, or the very long wavelengths. Thus, when the first government regulations were imposed on radio in 1912, the amateur operators, whose interest in the medium was personal and experimental, rather than commercial, got the short end of the stick. They were given the use of wavelengths of 200 metres and shorter.

As we know today, short-wave communication is subject to much noise and static. Companies using short-wave therefore sought to identify and find ways of mitigating this noise. At AT&T Bell Labs in New Jersey, a young radio engineer named Karl Janksy was assigned the task of identifying the sources of short-wave noise. He built a highly directional antenna to work at about 22 MHz, and began to make systematic observations. Most of the noise he found was due to thunderstorms and other terrestrial causes. However, one source of static that seemed to appear four minutes earlier every day was also found. What Jansky had discovered was radio noise emitted from the centre of our Milky Way Galaxy. Janksy made his discovery in 1932, and it was made public in 1933.

In 1937, Grote Reber built a 32-foot-diameter parabolic dish antenna in his backyard, which enabled him to detect cosmic radio emissions by 1939. Two years later, he made his first survey of the sky at radio wavelengths.

## Astronomy and the environment

Like every other human endeavour, exploration of the universe takes place in the context of our terrestrial environment. As human activity changes that environment, issues are raised for both astronomers and those who enjoy the fruits of their research.[2]

Among these are problems caused by 'light pollution', the issue of reconciling the need for new observatory sites with the safeguarding of endangered species, the difficulty of protecting the frequencies needed for radio astronomy from the encroachment of cellular phones and other forms of radio communication on Earth, and the problem of how we protect other planets from Earth's micro-organisms and the Earth from possible extraterrestrial microbes.

### Light pollution

Fewer and fewer places on Earth remain truly dark at night, as electric lights spread across the globe. For astronomers trying to collect the faint light of distant objects, this 'light pollution' is a serious problem. Some lights are worse than others in terms of the number of wavelengths they block from celestial objects. Steps have to be taken to balance the lighting needs of cities with the requirements of scientists doing research.

### Observatory sites and the environment

While many new observatories must now file an environmental impact statement, the most publicized clash between astronomers and environmentalists was over a site in Arizona (USA) called Mount Graham, where there was some concern about an endangered species of squirrel.

### Radio interference

Radio astronomers search for 'faint' radio static from cosmic objects. Increasingly, the signals they search for are lost in the noise of terrestrial radio communications, particularly the requirements of cellular phones and other modern communications using satellites.

### Preventing the contamination of Earth or other worlds

As robotic probes travel to the other bodies in our solar system, and even begin to return samples to Earth, the issue of planetary contamination must be confronted. How do we keep our microbes from hitching a ride to other worlds, and how do we prevent any possible celestial microbes from getting to Earth and (possibly) harming life on our planet?

## INFRARED ASTRONOMY

Infrared astronomy deals with the detection and study of the infrared radiation (heat energy) emitted from objects in the universe.[3] Every object that has a non-zero temperature radiates in the infrared. In the field of astronomy, the infrared region lies within the range of sensitivity of infrared detectors, which is between about 1 and 300 microns. The human eye detects only 1 per cent of light at 0.69 microns, and 0.01 per cent at 0.75 microns, and so effectively cannot see wavelengths longer than about 0.75 microns unless the light source is extremely bright. So infrared astronomy provides us with a window through which we can view what would otherwise be invisible.

The universe sends us a tremendous amount of information in the form of electromagnetic radiation. Only a small amount of this infrared information reaches the Earth's surface, yet by studying this small range of infrared wavelengths, astronomers are able to uncover a wealth of new information.

Only since the early 1980s have infrared telescopes been sent into orbit around the Earth and above the atmosphere, which hides most of the universe's electromagnetic radiation from us. The first of these satellites – IRAS (Infrared Astronomical Satellite) – detected about 350,000 infrared sources, increasing the number of catalogued astronomical sources by about 70 per cent.

### Exploring the universe

In the infrared, astronomers can gather information about the universe. Astronomers have discovered that all distant galaxies are moving away from us and that the farther away they are, the faster they are moving. When an object is moving away from us, the light that it emits is 'redshifted'. This means that the wavelengths get longer and are thus shifted towards the red part of the spectrum. As a result of this Doppler Effect, at large redshifts, all of the ultraviolet and much of the visible light from distant sources is shifted into the infrared part of the spectrum by the time it reaches our telescopes. Thus the only way to study this light is in the infrared itself.

## Infrared radiation

This is electromagnetic radiation with a wavelength longer than that of visible light, extending from about 1 micrometer to 1 millimetre. The primary source of infrared radiation is heat or thermal radiation. Any object which has an above absolute zero (-459.67 °F or -273.15 °C or 0 Kelvin), radiates in the infrared.

In infrared observations, a telescope collects radiation, just as in the optical region. The incoming radiation consists of radiation from the object, from the background and from the telescope itself. Both source and background must be continually measured, the difference giving the radiation from the object.

With infrared analysis, it is possible to determine the average surface temperatures of the planets, which range from about -400 °C for Mars to below -1,750 °C for Saturn.

## The emission mechanism

Objects in space are surrounded by dense clouds of very cold material, circumstellar shells whose grains and dust particles absorb photons of higher energy and reradiate the energy as large numbers of low energy infrared photons at infrared wavelengths corresponding to their temperatures. Thermal radiation is of particular interest for extraterrestrial objects possessing extensive atmospheres, since it would be expected to originate in a deeper layer than optical light. In space, there are many regions that are hidden from optical telescopes because they are embedded in dense regions of gas and dust. However, infrared radiation, having wavelengths that are much longer than visible light, can pass through dusty regions of space without being scattered. This means that we can study objects hidden by gas and dust in the infrared, which we cannot see in visible light, such as the centre of our galaxy and regions of newly forming stars. Terrestrial infrared observatories need to be built on high mountaintops, below which most of the atmospheric water vapour remains. This is because the vapour absorbs infrared radiation significantly. For observations in the far infrared, mountains are not high enough; observations are thus carried out on aeroplanes, balloons and satellites.

## Detecting cool objects

Many objects in the universe that are much too cool and faint to be detected in visible light can be detected in the infrared. These include cool stars, infrared galaxies, nebulae, interstellar molecules, planets, and clouds of particles around stars. For example, the visible light from a planet is hidden by the brightness of the star that it orbits. In the infrared, where planets have their peak brightness, the brightness of the star is reduced, making it possible to detect a planet in the infrared.

## Infrared spectroscopy

Determining which atoms and molecules are present in space, what their distribution and abundance are, and in what environments they exist is critical to our understanding of the universe, the formation of stars, planets and galaxies, and the possibility of life beyond Earth. The infrared part of the spectrum is where the emission and absorption lines of virtually all molecules as well as numerous atoms and ions lie. Spectrometers onboard infrared missions like the Kuiper Airborne Observatory (KAO) and the Infrared Space Observatory (ISO), as well as near-infrared spectra from ground-based observatories, have led to the discovery of hundreds of atoms and molecules in many different regions of space.

## CONCLUSION

Since its inception, the science of astronomy had been limited to the observation of objects in the visible light spectrum. The detection of radio emissions added a new dimension to our perception. From Reber's modest backyard antenna built in 1937, to the James Clerk Maxwell Telescope with its state-of-the-art multi-feed receiver system, single-dish radio telescopes have made great contributions to radio astronomy. The single-dish telescope has not been rendered obsolete by interferometers; rather, they work together as a complementary couple, with single-dishes giving an overview of the large-scale structure of the cosmos, and interferometers revealing the fine details. The astronomical research programmes carried out by single-dish radio telescopes have expanded our skyview, thus enabling a better understanding of the universe. Objects that can be seen in visible light can also be studied in the infrared. In addition to discovering new objects and viewing previously unseen areas of the universe, infrared astronomy can add to what we already know about visible objects. To get a complete picture of any object in the universe we need to study all the radiation that it emits.

## NOTES

1. For the following, see NASA's 'Brief History of Rockets': http://www.grc.nasa.gov/WWW/K-12/TRC/Rockets/history_of_rockets.html.
2. The following relies upon A. Fraknoi's 'Environmental Issues and Astronomy: An Introductory Resource Guide', Foothill College and the Astronomical Society of the Pacific: http://www.astrosociety.org/education/resources/environment.html.
3. The following discussion relies upon NASA's Infrared Processing and Analysis Center's (IPAC) 'IR Astronomy: Overview': http://www.ipac.caltech.edu/Outreach/Edu/importance.html.
4. Timeline adapted from: 'Time Line of Space Exploration': http://my.execpc.com/~culp/space/timeline.html.

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## ANNEX: A CHRONOLOGY OF SPACE EXPLORATION[4]

**1856** – Astronomers use thermocouples and thermopiles to detect infrared radiation from the Moon.

Early **1900s**, infrared radiation is detected from the planets Jupiter and Saturn and from some bright stars.

**4 October 1957** – *Sputnik 1*, the first man-made object to orbit the Earth, is launched by the USSR, and remains in orbit until 4 January 1958.

**3 November 1957** – *Sputnik 2*, is launched by the USSR, and remains in orbit until 13 April 1958.

**31 January 1958** – *Explorer 1*, the first US satellite in orbit, lifts off at Cape Canaveral using a modified ABMA-JPL Jupiter-C rocket.

**5 March 1958** – *Explorer 2* is launched by a Jupiter-C rocket, and fails to reach orbit.

**17 March 1958** – *Vanguard 1* satellite is launched into orbit.

**15 May 1958** – *Sputnik 3* is launched by the USSR.

**1 October 1958** – NASA is founded, taking over the existing National Advisory Committee for Aeronautics.

**11 October 1958** – *Pioneer 1*, US-IGY space probe, is launched to a height of 70,700 miles.

**2 January 1959** – The USSR launches *Luna 1*, the first man-made satellite to orbit the Sun.

**3 March 1959** – *Pioneer 4*, the fourth US-IGY space probe, is launched by a Juno II rocket, and achieves an Earth-Moon trajectory, passing within 37,000 miles of the Moon.

**12 September 1959** – *Luna 2*, bearing the Soviet coat of arms, is launched, hitting the Moon on September 13.

**4 October 1959** – *Luna 3* translunar satellite is launched and orbits the Moon.

**1 April 1960** – *Tiros 1*, the first successful weather satellite, is launched by the US.

**18 August 1960** – *Discoverer XIV* launches the first US camera-equipped Corona spy satellite.

**12 April 1961** – *Vostok 1* is launched by the USSR, carrying cosmonaut Yuri A. Gagarin, the first man in space, who orbits the Earth once.

**5 May 1961** – Mercury *Freedom 7* carries Alan B. Shepard, Jr., the first American in space, into a sub-orbital flight.

**6 August 1961** – The USSR launches *Vostok 2*.

**1961** – Development of the germanium bolometer, which works best at an extremely low temperature.

**20 February 1962** – Mercury *Friendship 7* lifts off with John H. Glenn, Jr., who orbits the Earth three times.

**24 May 1962** – Mercury *Aurora 7* is launched and completes three orbits.

**10 July 1962** – US satellite *Telstar 1* beams the first live transatlantic telecast.

**14 December 1962** – US *Mariner 2*, the first successful planetary spacecraft, flies past Venus and enters a solar orbit.

**16 June 1963** – *Vostok 6* carries Soviet Cosmonaut Valentina Tereshkova, the first woman in space, and orbits the Earth 48 times.

**31 July 1964** – US *Ranger 7* relays the first close-range photographs of the Moon.

**18 March 1965** – Alexei A. Leonov makes the first space walk from Soviet *Voskhod 2*.

**23 March 1965** – First manned flight of the Gemini programme, *Gemini 3*.

**24 March 1965** – *Ranger 9* transmits high-quality images of the Moon.

**3 June 1965** – Edward White II makes the first US space walk from *Gemini 4*.

**14 July 1965** – US *Mariner 4* returns the first close-range images of Mars.

**16 November 1965** – Soviet *Venera 3* is launched and impacts Venus on 1 March 1966.

**4 December 4 1965** – *Gemini 7* is launched carrying Frank Borman and James A. Lovell, Jr., making 206 orbits around Earth and proving a trip to the Moon possible.

**15 December 1965** – American astronauts Walter Schirra, Jr. and Thomas Stafford in *Gemini 6* make the first space rendezvous with *Gemini 7*.

**3 February 1966** – Soviet *Luna 9* is the first spacecraft to soft-land on the Moon.

**1 March 1966** – Soviet *Venera 3* impacts on Venus, the first spacecraft to reach another planet. It fails to return data.

**March 1966** – Soviet *Luna 10* is the first spacecraft to orbit the Moon.

**2 June 1966** – *Surveyor 1* is the first US spacecraft to soft-land on the Moon.

**14 August 1966** – US *Lunar Orbiter 1* enters Moon orbit, and takes the first picture of the Earth from the distance of the Moon.

**23 April 1967** – Soviet *Soyuz 1* is launched, carrying Vladimir M. Komarov. On 24 April it crashes, killing Komarov, the first spaceflight fatality.

**18 October 1967** – *Venera 4* sends a descent capsule into the Venusian atmosphere, returning data about its composition.

**15 September 1968** – Soviet *Zond 5* is launched, the first spacecraft to orbit the Moon and return.

**11 October 1968** – *Apollo 7* is the first manned Apollo mission, with Walter M. Schirra, Jr., Donn F. Eisele, and Walter Cunningham. It orbits the Earth once.

**21 December 1968** – *Apollo 8* is launched using the *Saturn V* rocket, thus becoming the first manned spacecraft to orbit the Moon and making 10 orbits on its 6-day mission.

**January 1969** – *Soyuz 4 and 5* perform the first Soviet spaceship docking, transferring cosmonauts between vehicles.

**20 July 1969** – Using *Apollo 11*, Neil Armstrong and Edwin (Buzz) Aldrin, Jr., make the first manned soft landing on the Moon, and the first moonwalk.

**31 July 1969** – *Mariner 6* returns high-resolution images of the Martian surface, concentrating on the equatorial region.

**5 August 1969** – *Mariner 7* returns high-resolution images of the Martian surface, concentrating on the southern hemisphere.

**11 April 1970** – *Apollo 13* is launched, suffering an explosion in its oxygen tanks. Its Moon landing is aborted, and the crew returns safely.

**12 September 1970** – Soviet *Luna 16* is launched, conducting the first successful return of lunar soil samples by an automatic spacecraft.

**17 November 1970** - *Luna 17* lands on the Moon, with the first automatic robot, *Lunokhod 1*. Driven from Earth by a five-person team, it travels over the surface for 11 days.

**15 December 1970** – Soviet *Venera 7* is the first probe to soft-land on Venus.

**1970s** – Astronomers around the world begin to consider the possibility of placing an infrared telescope on a satellite in orbit around the Earth.

**31 January 1971** – The US launches *Apollo 14* (Moon mission).

**19 April 1971** – *Salyut 1* space station is launched by the USSR. It remains in orbit until 28 May 1973.

**30 May 1971** – The United States launches *Mariner 9*, which becomes the first spacecraft to survey Mars from orbit.

**13 November 1971** – US *Mariner 9* (launched 30 May 1971) is the first spacecraft to orbit another planet, Mars.

**2 March 1972** – *Pioneer 10* is launched on an Atlas/Centaur/TE364-4 towards Jupiter by the US, designed to familiarize alien life with humans.

**15 July 1972** – *Pioneer 10* becomes the first man-made object to travel through the asteroid belt.

**5 April 1973** – *Pioneer 11* is launched on an Atlas/Centaur/TE364-4, flying past Jupiter in 1974, and Saturn in 1979, where it discovers new rings.

**14 May 1973** – *Skylab* Workshop is launched by the US and maintained by three crews.

**25 May 1973** – First crew to *Skylab 2* is launched, repairing damage incurred to *Skylab* during its launch.

**3 November 1973** – American *Mariner 10* is launched, on the first dual-planet mission.

**17 May 1974** – NASA launches the first Synchronous Meteorological Satellite, SMS-1.

**24 June 1974** – Soviet *Salyut 3*, their first military space station, is launched.

**26 December 1974** – Soviet *Salyut 4*, a civilian space station, is launched.

**22 June 1976** – Soviet military space station *Salyut 5* is launched.

**August–September 1977** – *Voyagers 1* and 2 leave Earth to reach Jupiter in 1979 and Saturn in 1980.

**3 September 1976** – *Viking 2* lands on Mars on the Plain of Utopia.

**29 September 1977** – Soviet *Salyut 6* space station is launched.

**1977** – An international collaboration is formed by the Netherlands, United States and Great Britain to develop IRAS, the Infrared Astronomical Satellite.

IRAS is launched on 25 January 1983 with an array of 62 detectors.

It increases the number of catalogued astronomical sources by about 70 per cent, detecting about 350,000 infrared sources. IRAS discoveries include a disk of dust grains around the star Vega, six new comets, and very strong infrared emission from interacting galaxies.

Many of the new advances in infrared radiation arose from US Department of Defense research into infrared array technology in the 1980s. Development of infrared array detectors in this period causes another giant leap in the sensitivity of infrared observations. These arrays allow astronomers to produce images containing tens of thousands of pixels at the same time.

**November 1978** – The Einstein Observatory begins its thirty-day mission.

**December 1978** – Two *Pioneer* spacecraft reach Venus, which is 38.2 million km, at its closest, from Earth.

**1 September 1979** – *Pioneer 11* reaches Saturn, flying to within 13,000 miles and taking the first close-up photographs.

**12 April 1981** – The first manned mission of the Space Transportation System (STS-1), *Columbia*, is launched.

**19 June 1981** – The European Space Agency launches its third Ariane rocket.

**1 March 1982** – *Venera 13* lands on Venus, and provides the first Venusian soil analysis.

**19 April 1982** – Soviet *Salyut 7* space station is launched.

**13 May 1982** – Soviet cosmonauts are launched in *Soyuz-T 5* to rendezvous with *Salyut 7*. They return to Earth in *Soyuz-T 7*.

**August 1982** – *Voyager 2* completes its flyby of Saturn.

**11 November 1982** – The space shuttle *Columbia's* fifth mission deploys two satellites.

**4 April 1983** – The space shuttle *Challenger* lifts off for its first mission (STS-6).

**19 June 1983** – Sally Ride is first US woman in space, on *Challenger* mission STS-7.

**10 October 1983** – Soviet *Venera 15* returns images of Venus' polar area.

**28 November 1983** – The space shuttle *Columbia* carries the European Space Agency (ESA) Spacelab-1 into orbit (STS-9). Its crew includes Ulf Merbold, a German and first ESA member in space.

**January–November 1983** – The Infrared Astronomical Satellite finds new comets, asteroids, galaxies, and a dust ring around the star Vega that may be new planets.

**3 February 1984** – Bruce McCandless takes the first untethered space walk from the space shuttle *Challenger* (STS-41B) (Plate 89).

**30 August 1984** – The third space shuttle, *Discovery*, lifts off on its maiden voyage (STS-41D).

**5 October 1984** – Launch of space shuttle *Challenger* mission STS-41G carrying the first crew with two women aboard – Sally Ride and Katherine Sullivan.

**December 1984** – Soviet/International *Vega 1* and 2 are launched, dropping probes into Venus' atmosphere before continuing to Halley's comet.

**8 January 1985** – Japan's Institute of Space and Aeronautical Science launches the Sakigake probe.

**29 April 1985** – The *Challenger* carries the ESA Spacelab-3 into orbit (STS-51B).

**2 July 1985** – The European Space Agency launches the Giotto spacecraft from an Ariane rocket.

**July–August 1985** – An infrared telescope is flown onboard the Space Shuttle's *Spacelab 2* to complement observations made by the IRAS mission. This mission produces a high-

quality map of about 60 per cent of the plane of our galaxy.

**3 October 1985** – The fourth shuttle *Atlantis* takes off on its first mission (STS-51J).

**October 1985** – *Spacelab D1*, the first joint German/ESA mission, is flown.

**January 1986** – *Voyager 2* flies past Uranus.

**20 February 1986** – The core unit of Soviet space station *Mir* is launched.

**March 1986** – Astronomers discover an invisible gravity source that splits a quasar's light.

**April 1986** – Astronomers find that our galaxy is smaller than they thought and the Sun is 23,000 light-years from its centre.

**December 1987** – Cosmonaut Yuri V. Romanenko returns from space station *Mir*, having arrived there from *Soyuz-TM 2*.

**4 May 1989** – Space Shuttle *Atlantis* is launched (STS-30), deploying the spacecraft *Magellan*.

**18 October 1989** – US launches the *Galileo* spacecraft from Shuttle *Atlantis* flight STS-34, which takes infrared images of Venus and asteroid Ida, before continuing to Jupiter.

**November 1989** – NASA launches the COBE satellite to study both infrared and microwave characteristics of the cosmic background radiation. COBE maps the brightness of the entire sky at several infrared wavelengths and discovers that the cosmic background radiation is not entirely smooth.

**5 April 1990** – US *Pegasus* rocket is deployed from a B-52 bomber, and launches the *Pegsat* satellite in the first demonstration of the *Pegasus* launch vehicle.

**24 April 1990** – Space Shuttle *Discovery* launches on STS-31, deploying the *Edwin P. Hubble Space Telescope* (HST) astronomical observatory.

**August 1990** – US spacecraft *Magellan* arrives at Venus.

**6 October 1990** – Space Shuttle *Discovery* launches the *Ulysses* spacecraft with two upper stages, on mission STS-41.

**7 February 1991** – *Salyut 7* falls from orbit and burns up over Argentina.

**5 April 1991** – Space Shuttle *Atlantis* carries the *Compton Gamma Ray Observatory* into orbit.

**5 June 1991** – Shuttle *Columbia* carries the *Spacelab* SLS-1 into orbit, to conduct investigations into the effects of weightlessness on humans.

**2 May 1992** – Space Shuttle *Endeavour* lifts off on its first mission (STS-49), repairing the Intelsat VI satellite.

**25 September 1992** – *Mars Observer* lifts off, the first American probe to Mars since *Viking 2* in 1976.

**2 December 1993** – Space Shuttle *Endeavour* launches on STS-61, making the first on-orbit service of the *Hubble Space Telescope* (HST).

**25 January 1994** – US launches *Clementine*, a new DOD satellite that performs a lunar mapping mission using advanced ballistic missile defence technologies.

**February 1994** – A Russian cosmonaut, Sergei Krikalev, flies on board the US space shuttle *Discovery* for the first time (STS-60).

**12 October 1994** – Spacecraft *Magellan* enters the atmosphere of Venus, burning up following the completion of its mapping mission.

**6 February 1995** – Space shuttle *Discovery* manoeuvres to within 37 feet of Russian space station *Mir*, in preparation for a shuttle-*Mir* docking (STS-63) (Plate 90).

**March 1995** – Japan launches the Infrared Telescope in Space (IRTS).

**26 June 1995** – Space Shuttle *Atlantis* rendezvous with Russian space station *Mir* during a ten-day mission on STS-71.

**September 1995** – *Pioneer 11* ceases making scientific observations, its power source nearly depleted.

**12 November 1995** – Space Shuttle *Atlantis* lifts off on mission STS-74, making the second docking with Russian space station *Mir*.

**November 1995** – The European Space Agency launched the Infrared Space Observatory (ISO), which observes at wavelengths between 2.5 and 240 microns.

**7 December 1995** – The Galileo spacecraft arrives at Jupiter.

**8 February, 1996** – Thomas Reiter becomes the first European Space Agency astronaut to make two space walks (both from the Russian *Mir* space station).

**17 February 1996** – NASA launches the first in the *Discovery* series of spacecraft, the Near-Earth Asteroid Rendezvous (NEAR) spacecraft, aboard a Delta II-7925-8 rocket.

**April 1996** – The Midcourse Space Experiment (MSX) is launched and lasts until its liquid helium coolant runs out in Feb. 1997, gathering a vast amount of data at 4.2–26 microns.

**19 November 1996** – Space Shuttle *Columbia* lifts off on its twenty-first space flight, setting a new shuttle in-space endurance record of almost 18 days.

**12 January 1997** – Space Shuttle *Atlantis* lifts off for the fifth docking with the *Mir* space station.

**31 March 1997** – After 25 years of operation, routine telemetry and ground control with *Pioneer 10* are terminated. The probe at that moment is 6.7 billion miles from Earth, travelling at 28,000 miles per hour. In two million years, it will reach the red giant Aldeberan in the constellation of Taurus.

**1 July 1997** – Space Shuttle *Columbia* lifts off again to complete the flight aborted in April. The shuttle is outfitted with *Spacelab*, set up as a microgravity science laboratory.

**4 July 1997** – *Mars Pathfinder* becomes the first probe to successfully land on Mars since *Viking 2* in 1976.

**7 August 1997** – Space Shuttle *Discovery* lifts off for a 12-day mission to deploy and retrieve the *Crista-Spas 2* satellite, which studied the Earth's middle atmosphere.

**27 September 1997** – Space Shuttle *Atlantis* performs its seventh docking with *Mir* to support the repair and upgrade process.

**19 November 1997** – Space Shuttle *Columbia* lifts off with three American astronauts, one Japanese, and the first Ukrainian astronaut, Leonid Kadenyuk.

**7 January 1998** – *Lunar Prospector* is the first NASA mission to the Moon in 25 years, and the first dedicated to lunar research since *Apollo 17* in 1972.

**22 January 1998** – Space Shuttle *Endeavour* lifts off to rendezvous with *Mir*, the eighth US docking with the Russian space station and the first by a shuttle other than *Atlantis*.

**17 April 1998** – Space Shuttle *Columbia* lifts off on a 16-day mission, its 25th.

**2 June 1998** – Space Shuttle *Discovery* lifts off on a 10-day mission, its 24th and the last shuttle docking with *Mir*.

**3 July 1998** – Japan launches the *Nozomi* probe to Mars.

**3 October 1998** – Launched by the US National Reconnaissance Office, the *Space Technology Experiment (STEX)* satellite tests 29 new spacecraft designs.

**24 October 1998** – NASA launches *Deep Space 1*, a technology test spacecraft that evaluates a dozen advanced spacecraft engineering designs.

**20 November 1998** – The first component of the International Space Station, *Zarya*, is launched on a Russian rocket.

**4 December 1998** – Space Shuttle *Endeavour* lifts off on its thirteenth space flight, with the International Space Station's second module, *Unity*.

**11 December, 1998** – NASA launches *Mars Climate Orbiter*, with the objective of studying Martian weather. The probe is lost as it approaches Mars on 23 September 1999, due to an error in propulsion software, using English instead of metric units.

**3 January 1999** – *Mars Polar Lander* lifts off on its ill-fated mission to Mars. This NASA probe is to land within about 600 miles of the Martian South Pole. Contact with the probe is lost on 3 December 1999, and it is never heard from again.

**7 February 1999** – The NASA satellite *Stardust* lifts off for a rendezvous with the Comet Wild-2 in January of 2004.

**27 May 1999** – Space Shuttle *Discovery* lifts off for the International Space Station.

**19 November 1999** – China launches *Shenzhou*, the first unmanned test of their manned capsule.

**19 December 1999** – Space Shuttle *Discovery* lifts off for the third maintenance mission to the Hubble Space Telescope.

**3 January 2000** – The *Galileo* space probe safely completes its encounter with Jupiter's ice moon, Europa, at an altitude of 343 km.

**11 February 2000** – Space Shuttle *Endeavour* lifts off to carry out the Shuttle Radar Topography Mission, cosponsored by NASA and the National Imagery and Mapping Agency.

**14 February 2000** – *NEAR (Near Earth Asteroid Rendezvous)* probe settles into orbit around the asteroid 433 Eros, producing a series of stunning close-up images.

**19 May 2000** – Space Shuttle *Atlantis* lifts off for the *International Space Station (ISS)* for maintenance work on the crane and a faulty antenna; a Russian boom arm is installed.

**31 October 2000** – The *Expedition One* crew is launched on a *Soyuz* transport to become the first crew of the *ISS*.

**1 December 2000** – Space Shuttle *Endeavour* lifts off on a 12-day mission to the *ISS*.

**9 January 2001** – The first launch of the true millennium is Chinese, with the second test flight of the manned *Shenshou* spaceship.

**8 March 2001** – Space Shuttle *Discovery* is launched on a 14-day *ISS* construction mission.

**23 March 2001** – Fifteen years after its first launch, and after nearly 10 years of continuous occupation by astronauts, the *Mir* space station is de-orbited, breaking up in the atmosphere and crashing in the Pacific Ocean.

**7 April 2001** – The *2001 Mars Odyssey* probe is launched on a trajectory for Mars orbit to be achieved in October 2001.

**28 April 2001** – *Soyuz* spacecraft *TM-32* lifts off for the *ISS* with the first space tourist, business executive Dennis Tito, who pays the Russians $20 million for the ride.

**30 June 2001** – NASA's *Microwave Anisotropy Probe (MAP)* is launched on a trajectory for a gravity boost past the Moon to a position 1.5 million km outside Earth's orbit.

**12 July 2001** – Space Shuttle *Atlantis* lifts off for the *ISS* with the Joint Airlock, which will enable space walks to be performed directly from the space station itself.

**10 August 2001** – Space Shuttle *Discovery* lifts off for the *ISS* with the *Leonardo* laboratory module and *Simple Sat*, an experimental low-cost astronomical telescope.

# 17.6
# MATERIALS

*Eriabu Lugujjo*

Materials can be defined as substances possessing properties that make them useful in machines, structures, devices, and products. Materials are omnipresent and number in the thousands. Table 7 shows some materials that are of great interest to society.

Most products are made from many different kinds of materials to satisfy the needs of a product. Since there are so many different types of materials, one way to look at materials is to classify them as metals and non-metals.

## METALS AND NON-METALS

Metals are materials that are normally combinations of 'metallic elements'.[1] These elements, when combined, usually have electrons that are non-localized and as a consequence have generic types of properties. Metals are usually good conductors of heat and electricity. Also, they

are quite strong but malleable and tend to have a lustrous or shiny look when polished.

The category of non-metals includes plastics, semiconductors, ceramics, and composites. Plastics (or polymers) are generally organic compounds based upon carbon and hydrogen; they are very large molecular structures. Usually they are of low density and are not stable at high temperatures. Ceramics are generally compounds between metallic and non-metallic elements and are made from metal oxides, nitrides, silicates and carbides. Typically they are good insulators and resistant to high temperatures and harsh environments. Semiconductors have electrical properties intermediate between metallic conductors and ceramic insulators. In addition, the electrical properties are strongly dependent upon small amounts of impurities. Composites consist of more than one material type; fibreglass, a combination of glass and a polymer, is an example. Concrete and plywood are other familiar

*Table 7* **Commonly used metals**

| Classes | Examples | Principal Characteristics | Application |
|---|---|---|---|
| Metals and alloys | Steels, super-alloys, light alloys | Strength, toughness | Automobiles, aircraft, pressure vessels |
| Ceramics and cermets | Alumina, silicon nitride, metal carbides | Temperature and corrosion resistance, high hardness | Furnace refractories, engine components |
| Plastics and elastomers | Polymers, rubbers, polyurethanes | Strength, corrosion resistance, low density | Pipes, panels, process plant |
| Composites | Fibre-reinforced plastics, metals, or ceramics | Extremely tough, high strength/weight | Aircraft and other transport components |
| Construction materials | Building stone, cement | Durable, plentiful supply, cheap | Buildings, habitations, roads, bridges |
| Timber | Wood, wood composites | Ease of fabrication, strength | Furniture, buildings |
| Fibre | Cotton, nylon, glass | Diverse, manufacturing and handling ease | Textiles, fibre/plastic composites |
| Paper | Paper, paperboard | Diverse | Printing, decorating |

*Source:* Hondros, 1988.

composites. Many new combinations include ceramic fibres in a metal or polymer matrix. These metal and non-metal materials can also be characterized distinctly by their different physical and chemical properties.

## TRENDS IN MATERIALS SCIENCE AND ENGINEERING

Whereas in 1900 it was taken for granted that there were two kinds of sciences, the pure or basic, on the one hand, and the applied, on the other, this is no longer the case.[2] By pursuing simultaneously both cognitive and practical interests, emerging disciplines such as materials science overthrew this clear-cut distinction.

Materials science is a hybrid entity coupling fundamental research with engineering application of the end product. The generic concept of materials presupposes that such diverse substances as metals, polymers, glass, or semiconductors share certain characteristics.

The dramatic role of iron throughout the ages is not really the result of its being 'strong', as one might imagine. In reality, iron has been important because heating and cooling can modify its properties; this is just one area of materials science and engineering.

One major objective of materials science and engineering is to create materials by design, that is, structures tailored for specific purposes, whose properties are adapted to a set of specific tasks. This goal was achieved only after the development of specialized instruments providing access to the microstructure of materials. X-ray diffraction was the first of the new techniques for imaging the micro-world that fostered the development of materials science and technology. Light transmission microscopes were also used. In 1931, Max Knoll and Ernst Ruska in Germany developed the first type of electron microscope – the transmission electron microscope (TEM). The TEM is patterned exactly on the light transmission microscope except that a focused beam of electrons is used instead of light to 'see through' the specimen. Electron microscopes are scientific instruments that use a beam of highly energetic electrons to examine objects on a very fine scale. The first scanning electron microscope (SEM) was created in 1942, and the first commercial instruments became available around 1965. The SEM's late development was due to the electronic difficulties involved in 'scanning' the beam of electrons across the sample. In the SEM, the beam of high-energy electrons is scanned across the specimen, and the current created by the secondary electrons is converted into a signal displayed on a cathode ray tube (CRT). Each new technique opened up new windows on the microstructures within.

The key stage in the evolution of plastics occurred in 1939, which marked the commercial development of nylon. Zone refining, a purification process critical to the development of silicon technology, also emerged in the 1940s. The silicon chip is an innovation that launched the information revolution, for it is the basis of radio, television, telecommunications of many kinds, computers, the Internet,

*Figure 2* **Philosophy of research and development in materials science and engineering**
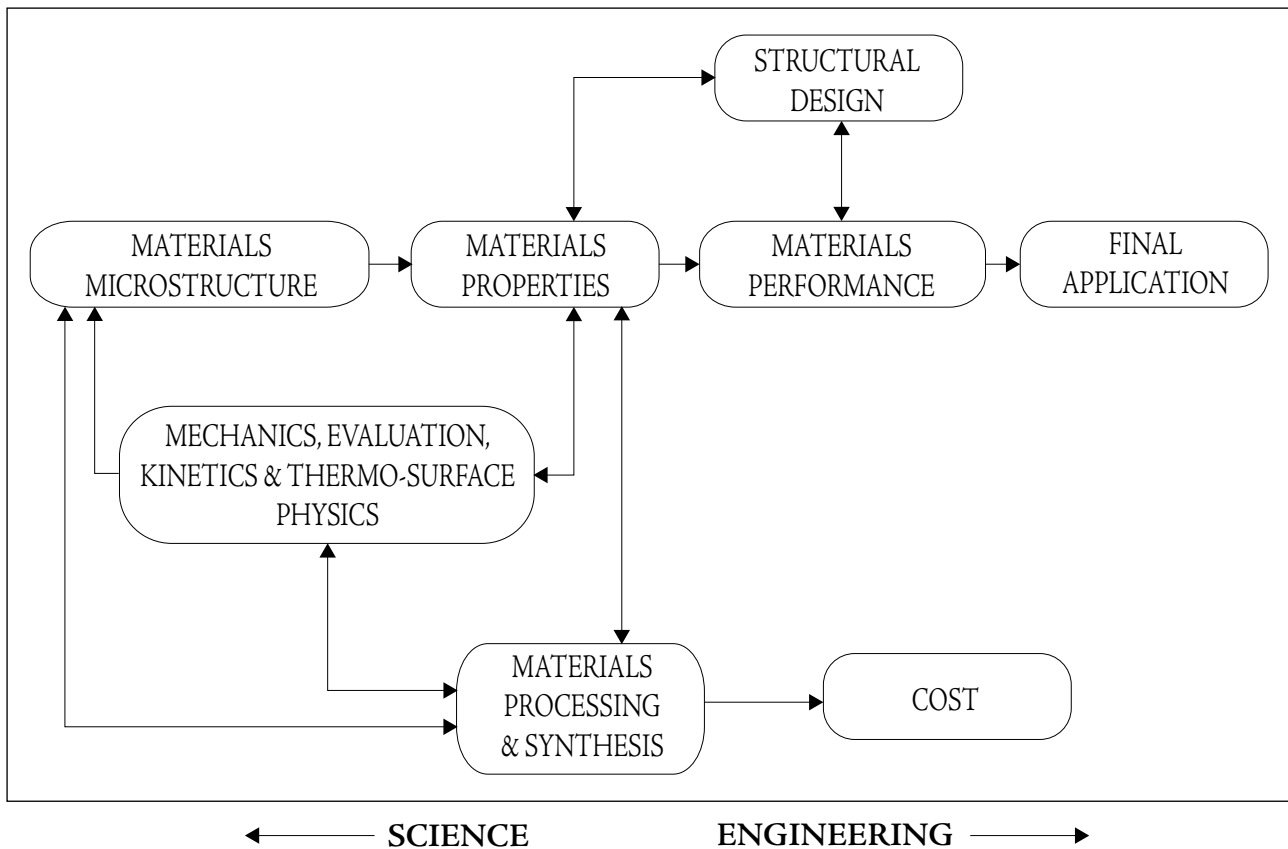


*Source:* Rohatgi, 1988.

intelligent monitoring and control systems, and a host of other services.

Another prominent development was the introduction of aluminium, both for simple but extensively used domestic utensils and, in a much more demanding role, for aircraft structures, which has made the era of inexpensive mass air transport possible. The main materials development underlying this has been the large-scale electrolytic reduction of aluminium ore using low cost electricity, but improvement of the metal by alloying was also a contributing factor.

The 1950s saw the development of high temperature alloys. Nickel-based alloy developments impacted on jet engine development. In 1955, polymerization catalysts were discovered for polymers, and this opened a way for a new range of plastics, polymers, and synthetic fabrics and also led to phenomenal growth in engineering applications. The development of technology capable of producing smaller and smaller silicon wafers was the major science and engineering achievement of the 1960s.

The 1970s were marked by the emergence of new industries based upon materials processing of recycled scrap iron; mini-mills were developed. Less spectacular, but perhaps even more important, has been the massive production and widespread use of structural steel, again the result of inexpensive production on a truly grand scale. In fact, steel remains to this day the cheapest means of buying sheer tensile strength. Sintering techniques (forming shapes using metal powder) also improved many manufacturing processes. Rapid evolution coupled with the ability to make ceramic materials characterized a good part of the 1980s. Important to note during this time was the development of high-temperature ceramic superconductors.

Another significant development that influenced the future direction of material science and technology was the broad movement towards creating materials that would have greater 'knowledge input' per unit weight. This reflected a strong historical trend among competing industrial countries to develop products with a high added value. Recent advances in materials engineering have been made in such areas as photonic devices for optical computing, forming sheet metal using numerical simulation, explosion-proof electromechanical equipment for anti-terrorism purposes, and nanotechnology – the science of design of materials at a nanometre ($10^{-9}$ m) level.

## ADVANCES AND APPLICATIONS IN DIVERSE FIELDS

Advances in materials science have occurred in many fields: medicine, energy utilization, transportation, and information and communication. Most of these developments have resulted from interdisciplinary research. The following section gives some examples of different materials and their application in diverse fields.

### Materials for medicine

Advances in tissue and organ engineering and repair are likely to result in the development of organic and artificial replacement parts for humans. The field of tissue engineering was born in the 1990s. In addition to organic structures, advances are likely to continue in engineering artificial tissues and organs for humans. Researchers are developing multi-functional materials that provide both structure and function or possess different properties, enabling new applications and capabilities. For example, polymers with a hydrophilic shell around a hydrophobic core (biomimetic of micelles) can be used for timed release of hydrophobic drug molecules, as carriers for gene therapy or immobilized enzymes, or as artificial tissues. Polymers stabilized by sterilizing could also be used for drug delivery. Ceramics such as bioactive calcia-phosphate-silica glasses (gel-glasses), hydroxyapetite, and calcium phosphates can serve as templates for bone growth and regeneration. Biomimetics is the design of systems, materials, and their functionality to mimic nature. Current examples include layering of materials to achieve the hardness of an abalone shell or trying to understand why spider silk is stronger than steel.

### Buildings

Research on composite materials, waste management, and recycling has reached the stage where it is now feasible to construct buildings using materials fabricated from significant amounts of indigenous waste or recycled material content. These approaches are finding an increasing number of cost-effective applications, especially in developing countries. Examples include the Petronas Twin Towers in Kuala Lumpur, Malaysia (Plate 91). These towers are the tallest buildings on earth and are made with reinforced concrete rather than steel. A roofing material used in India is made of natural fibres and agro-industrial waste. Table 8 shows raw materials used in the making of cement – a major component of construction works.

Prefabricated composite materials for home construction have also been developed in the United States, and a firm in the Netherlands is developing a potentially ubiquitous, inexpensive housing approach targeted for developing countries that uses spray-on material over an inflatable air shell.

### Transportation

Millions of cars, trucks and other transportation equipment produced every year consume huge quantities of materials. Therefore the development of lightweight materials for automobiles that increase energy efficiency while reducing emissions is a welcome innovation. Here the key issue is the strength-to-weight ratio vs. cost. Advanced composites

*Table 8* **Raw materials in Portland cement**

*(percentage of total composition)*

| Raw material | Lime | Silica | Alumina | Iron oxide | Magnesia |
|---|---|---|---|---|---|
| Limestone | 52 | 3 | 1 | 0.5 | 0.5 |
| Chalk | 54 | 1 | 0.3 | 0.2 | 0.3 |
| Cement rock | 43 | 11 | 3 | 1 | 2 |
| Clay | 1 | 57 | 16 | 7 | 1 |
| Slag | 42 | 34 | 15 | 1 | 4 |

*Source:* Tegart, 1988.

with polymer, metal, or a ceramic matrix and ceramic reinforcement are already in use in space systems and aircraft. These composites are too expensive for automobile applications, so aluminium alloys are being developed and have been introduced in cars like the Honda Insight, the Audi A8 and AL2, and General Motors' EV1. Although innovation in both design and manufacturing is needed before such all-aluminium structures can become widespread, aluminium content in luxury cars and light trucks has increased in recent years. Polymer matrix, carbon fibre (C-fibre) reinforced composites could enable high mileage cars, but C-fibre is currently several times more expensive than steel. Spurred by California's regulations concerning ultra-low-emission vehicles, both Honda and Toyota have introduced gasoline-electric hybrid vehicles.

## Information and communication

Integrated chips are at the heart of modern information and communications systems. From vacuum tubes to transistors to integrated circuits and optical fibres, the dramatic rise in power systems that process and transmit information has resulted from advances in materials science. The research in *nanoscale materials* – materials with properties that can be controlled at sub-micrometre ($<10^{-6}$ m) or nanometre level – has improved the field of information and communication. The properties of some materials in these size regimes are often fundamentally different from those of ordinary materials. Examples include carbon nanotubes, quantum dots, and biological molecules. These materials can be prepared either by purification techniques or by tailored fabrication methods.

## Self-assembly technology

Self-assembly refers to the tendency of some materials to organize themselves into ordered arrays such as colloidal suspensions.[3] Examples of self-assembling materials include colloidal crystal arrays with mesoscale (50–500 nm) lattice constants that form optical diffraction gratings, a light-emitting diode (nanoscale), a porous metal array (by deposition followed by removal of the colloidal substrate), and a molecular computer switch.

## Rapid prototyping technology

This manufacturing approach integrates computer-aided design (CAD) with rapid forming techniques to quickly create a prototype (sometimes with embedded sensors) that can be used to visualize or test the part before making the investment in tools required for a production run. Originally, prototypes were made of plastic or ceramic materials and were not functional models, but now it is possible to make a functional part, out of materials such as titanium.

## Energy systems

Materials provide particular properties that are required for the conversion, transmission, and consumption of energy. Wood, water, coal, oil and gas are some of the materials that have long been used to provide energy in different parts of the world. An important objective is to lower the cost of energy. Materials advances have contributed significantly in improving efficiency in energy use – for instance in the heating or cooling of buildings, improving reliability and safety and also enabling alteration in the mixtures of the sources of available energy.

Along with investments in solar energy, current investments in battery technology and fuel cells could enable continued trends in more portable devices and systems while extending operating times. Advances in fusion and fission of materials have also led to use of nuclear energy.

## Magnetic refrigeration and other advances

The discovery in the late 1990s of a new class of materials represented a significant advance in the cooling power of materials currently used for magnetic refrigeration. The new materials are made of a gadolinium-silicon-germanium alloy and have two advantages over existing magnetic coolants: they exhibit a giant magneto-caloric effect – the ability of certain materials to heat up when placed in a magnetic field, then to cool when taken back out again – and when used they provide a wide range of operating temperatures.

Advances in glazing materials for windows have led to windows' being more energy efficient while offering increased comfort; these techniques include the use of spectrally selective coatings, absorbing glazing, and reflective coatings.

Other materials advances are being applied in areas such as hot roll laminations in printed circuit materials, passive components (for non-energy generators) in electronics and other mobile components, computer chip-based assets, which enhance security and reliability, and non-destructive testing – a technique that led to safety of products and reduced risk of failure of materials or functions.

## Materials and socio-economic development

A better life and an improved standard of living are the fundamental aspirations of the 70 per cent of humanity living in the poor countries of Africa, Latin America, the Middle East, and South-East Asia, and socio-economic development is a means to achieve these goals. It is estimated that 2 billion people live below the poverty line worldwide. This situation is fertile ground for political unrest. Hopelessness and despair also lead people to immigrate to the industrialized countries in search of a better future.

Materials in the form of mineral resources can generate substantial wealth, but they can be depleted and are non-renewable. For sustainable development, these resources need to be managed in such a way that the wealth they generate can effectively compensate for the depleted mineral assets. Such management is especially important in those countries that are largely dependent on minerals for their economic development. Millions of people are employed in the production of primary materials and many more in the research and development of these materials. Materials are used in energy generation that is very crucial for sustainable development energy. Poverty and living conditions are linked to the way energy is used. Even though there is a

difference in energy use between industrialized and developing countries, the relationship between energy and sustainable development can be seen. Mining activities in different parts of the world where there are mineral reserves consisting of metals like manganese and iron, or non-metal construction materials such as ceramics and refractory minerals, have helped lift the economic status of the people involved in them.

Ceramic manufacturing has become an important industry because of the unlimited supply of clay in some parts of the world. An example is the Užice region of Serbia, where rich deposits of architecture stone and black and dark limestone exist. Biomedical advances (combined with other health improvements) using specialized materials are already increasing human life span in countries where they are applied. This affects issues such as population age demographics, financial support for retired persons, and increased healthcare costs for individuals. Advanced materials, which are normally not the end products, can lead to direct employment of members of society in the production of the primary commodities.

The twentieth century has seen incredible change in industrial countries brought about by the information revolution, based on radio, television, telecommunications of many kinds, and the ubiquitous computer and the Internet. One materials development has made all this possible: the silicon chip. The triumphal outcome of intense research and development of semiconductors means that silicon chips are now made by the millions and constitute the heart of all these information systems. The idea that computers are simple machines only useful for computation has given way to the use of computers for personal productivity with the advent of the microprocessor, thanks to material advances. As the power of these microprocessors has grown exponentially, so have has their usefulness as a vehicle for new media and socialization. Our current technological revolution is often mistakenly characterized as one limited to progress in information technologies. However, the role played by new materials is now becoming increasingly clear – and extends far beyond electronic components and computer hardware. Accordingly, numerous governments have undertaken to define strategies and priority lines of action in order to stimulate materials research and to more efficiently exploit the potential economic benefits of the advanced materials. In many countries these efforts have taken the form of research and development incentives, large research programmes partially financed from public funds, or specific market procurements. Authorities are also creating competitive environments by giving attention to the standard-setting processes, and reducing obstacles to materials diffusion with initiatives that encourage information dissemination, education and training, for example.

## CHALLENGES IN MATERIALS DEVELOPMENT AND APPLICATIONS – A GLOBAL PERSPECTIVE

The materials sector faces multiple challenges that arise from demand for new products with unique performance requirements, demand for improved performance or extended life of existing products, the availability of new manufacturing methods, cost reduction requirements, and international competition. The demand for new products with unique performance requirements can be seen in the aircraft industry, which focuses on the need to enhance basic capabilities including range, payload, speed, and operating cost. New manufacturing methods are needed in the automobile industry, especially because of regulations and competition.

The mining industry causes immense environmental pollution worldwide. Mining operations shift 28 billion tons of material yearly, that is, more than the quantity moved by all the rivers in the world. Mining generates 2.7 billion tons of waste, in part hazardous; an amount that far exceeds the world's total accumulated municipal garbage. Every year mines and smelters account for up to one-tenth of all the energy used by mankind and pump out into the atmosphere six million tons of sulphur dioxide, a major cause of acid rain. The mining industry also adds to land degradation and can be a heavy burden on women and children.

### A concern about exhaustible mineral resources

The increasing use of mineral raw materials since the beginning of the industrial era, and the unprecedented high rate of mineral production development especially after the Second World War, have led to great concern that we shall run out of non-renewable resources. This concern often translates into rapid price increases, along with growing awareness of the need for recycling. In energy production, one of the most difficult challenges in fusion reaction is dealing with neutron radiation for nuclear energy production. Neutrons produced during fusion can travel tens of centimetres out into the containment structure, causing damage to the constituent materials. Also very serious are the health hazards due to inhaling the smoke from biomass fuels used for cooking, especially in the poorer countries of the world. This problem is a major challenge for materials scientists and engineers working in the field of renewable energy. There has been criticism in the press about the use of nickel in some of the new European euro coins. Many people suffer from allergic dermatitis when they come into contact with nickel. Clearly the nickel industry faces a challenge too.

In many cases, one could argue that material developments together with associated computerization and installation of 'smart' manufacturing systems, have contributed to large-scale unemployment. These socio-economic effects also need to be addressed. The great challenge for materials science as far as international development is concerned, will be to increase the availability of materials required for housing, water, food, energy and healthcare by as much as 10 to 100 times in the decades to come, without increasing pressure on resources, energy requirements, the environment and employment. The population of many developing countries will have more than doubled in 50 years' time, and these countries will be trying to attain the standards enjoyed in the rich countries today.

### NOTES

1. For the following, see 'What are Materials?', Materials Science & Engineering Resource Center, The Minerals, Metals & Materials Society (TMS) Foundation: http://www.crc4mse.org/what/Index.html.

2.    The following discussion relies upon *Materials Science and Engineering: Forging Stronger Links to Users*, National Research Council, Washington, DC, 1999, pp. 8–10.

3.    P. S. Antón, R. Silberglitt, and J. Schneider, *The Global Technology Revolution: Bio/Nano/Materials Trends and Their Synergies with Information Technology by 2015*, Santa Monica, CA, 2001.

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# 17.7
## ENERGY SOURCES AND APPLICATIONS
### *Eriabu Lugujjo*

Since the beginning of human existence, energy has been one of our greatest needs. All our daily activities require energy. This same energy has been harnessed to foster political, economic and social development. The role of energy in determining the economic well-being of a society is often inadequately understood. In terms of total energy, the main energy source for any society is the Sun, which through the cycle of photosynthesis produces the food that fuels and sustains both individuals and populations.

Energy sources are generally grouped into two classes – renewable and non-renewable energy sources. Renewable energy sources are those that are likely to continue to exist so far into the future that they are thought to be unending, e.g. solar energy from the Sun, wind energy, hydro-electric power, energy from biomass and hydrogen, and – in theory, at least – wood. Non-renewable energy sources are those sources that are being depleted, e.g. coal, petroleum, natural gas and nuclear energy from radioactive elements.

## RENEWABLE ENERGY SOURCES

### Solar energy

The Earth is bathed in huge amounts of solar energy. The Sun, a typical star, is a fusion reactor that has been burning for over 4 billion years. Solar energy is our oldest energy source, and all life is maintained by this solar energy that is converted into chemical energy by plants. Humans have always used the Sun's energy directly (e.g. for drying clothes and foodstuffs) as well as indirectly to power the agriculture that supplies us with food. The history of solar energy technology takes us back to 1839, when Edmund Becquerel observed that 'electrical currents arose from certain light-induced chemical reactions'. This was later explained by the quantum theory in the beginning of the twentieth century. The development of the first solid-state devices in the late 1940s paved the way for the first usable silicon solar cell with 6 per cent efficiency. This solar cell had its first application on *Vanguard 1*, the first satellite to use electricity from the Sun. Today solar energy is being used for heating purposes, in homes and industries, and for generating electricity (Plate 92).

### Wind energy

Humans have harnessed the energy of the wind for over 2,000 years. The first windmills were built in Persia and converted wind energy into mechanical power. Until the Industrial Revolution, windmills were used extensively to provide power for many purposes such as pumping water and grinding grain. Wind was second only to wood as a source of energy. Wind turbines are now being used to convert wind energy into electricity. Winds are caused by the differential heating of the Earth's surface by the Sun. Wind is thus an indirect form of solar energy, and is therefore 'renewable'. Every location on Earth experiences wind, but the absolute amount of wind in any one area is highly variable. The average wind speed of a site is a very important factor in determining the cost of electricity generated from wind turbines. This is because the amount of energy that can be captured by a wind turbine increases as the cube of wind velocity (Plate 93).

### Biomass

Biomass is a renewable energy source derived from the carbonaceous waste of various human and natural activities. It is derived from numerous sources, including by-products from the timber industry, agricultural crop residues, municipal and industrial wastes. Biomass is an important source of energy and the most important fuel worldwide after coal, oil and natural gas.

### Wood

For thousands of years since the Stone Age, when our ancestors started the first intentional fire, wood has been the world's most common source of energy for cooking, heating and manufacturing. In fact, it has only been in the last few hundred years – since the Industrial Revolution – that humans have used other sources of energy such as fossil fuels. Many countries in the developing world still use wood as their primary energy source. Half of the energy used on the African continent is in the form of fuel wood. Wood is

a 'ligno-cellulosic' material ultimately formed by photosynthetic reactions within the leaves or needles of trees. Photosynthesis uses the energy of the Sun to take carbon dioxide ($CO_2$) from the air and convert it into organic material, releasing oxygen in the process. As the Sun is the source of wood energy (and all other biomass), wood is essentially a 'renewable' source of energy, which will be available as long as the sun shines. Nonetheless, environmentalists warn us that we may be depleting the Earth's wood reserves faster than nature can replenish this precious resource. There are three basic sources of wood, which can be used for the production of energy, namely the existing forests, wastes from forest products industry, and fuel wood plantations.

## Hydroelectric energy

Hydroelectric power plants convert the kinetic energy contained in falling water into electricity. The energy in flowing water is ultimately derived from the Sun, and is therefore constantly being renewed. Energy contained in sunlight evaporates water from the oceans and deposits it on land in the form of rain. Differences in land elevation result in rainfall runoff and allow some of the original solar energy to be captured as hydroelectric energy.

Hydroelectric power is currently the world's largest renewable source of electricity, accounting for 6 per cent of worldwide energy supply or about 15 per cent of the world's electricity. Traditionally thought of as a cheap and clean source of electricity, most large hydroelectric schemes being planned today are coming up against a great deal of opposition from environmental groups and indigenous peoples.

Hydroelectric power plants capture the energy released by water falling through a vertical distance, and transform this energy into useful electricity. In general, falling water is channelled through a turbine, which converts the water's energy into mechanical energy. The rotation of the water turbines is transferred to a generator, which produces electricity. The amount of generated electricity is dependant upon two factors, i.e. the vertical distance through which the water falls, called the 'head', and the flow rate, measured as volume per unit time. The electricity produced is proportional to the product of the head and the rate of flow.

## Geothermal energy

Geothermal energy is energy recovered from the heat of the Earth's core. In nature, geothermal heat shows up in the form of volcanoes, hot springs and geysers. For thousands of years, humans have used naturally occurring hot springs for bathing. More recently, geothermal energy has been used to generate electricity and to provide heat for homes and industries. Geothermal energy is a versatile and reliable source of heat and electricity, which generally produces none of the greenhouse gases associated with the combustion of fossil fuels. The high temperatures in the Earth's core are a result of heat trapped during the formation of the Earth approximately 4.7 billion years ago, as well as the decay of naturally occurring radioactive elements. Geothermal energy is often considered a renewable source of energy.

This is not strictly true, because human uses of geothermal energy generally remove the heat from a location faster than it is replaced. The magnitude of the geothermal resource is so large, however, on a human time scale, that it may be considered as a renewable energy source.

## Hydrogen

Hydrogen is the third most abundant element on the Earth's surface, where it is found primarily in water ($H_2O$) and organic compounds. It is generally produced from hydrocarbons or water; and when burned as an energy source, or converted to electricity, it joins with oxygen to again form water. Hydrogen is produced from sources such as natural gas, coal, gasoline, methanol, or biomass through the application of heat; from bacteria or algae through photosynthesis; or by using electricity or sunlight to split water into hydrogen and oxygen.

# NON-RENEWABLE ENERGY SOURCES

## Coal

Coal has been used as a fuel since about 1000 BC. Although coal is abundant in most parts of the world, it was not used extensively for fuel until the Industrial Revolution. The transition from wood as the main source of fuel to coal, which occurred at this time, was a result of dwindling fuel-wood supplies and the superior energy content of coal. From that point until the end of the nineteenth century, when oil and natural gas came on the scene, coal was the fuel that drove the Industrial Revolution. Coal was burned for a variety of different purposes, which included heating for manufacturing processes, cooking, mechanical power and transportation (steam trains and ships). Coal is a combustible, black sedimentary rock composed predominantly of carbon. It is formed out of plant matter that accumulated at the bottom of swamps millions of years ago, during the Carboniferous Period. The mining of coal is carried out using a variety of different methods depending upon how close the coal is to the ground surface. The United States, the former Soviet Union, China and India have the largest reserves of coal.

## Petroleum

Crude oil, also called petroleum, has become the world's foremost source of energy, and the backbone of our industrial society since its discovery near Titusville, Pennsylvania, in 1859, by a man drilling for water. Oil accounts for 38 per cent of energy use worldwide (Plate 94). Oil's liquid form, high energy density, and relatively clean burning nature make it the most versatile of all fuels. When oil was first discovered, it was primarily used in the form of kerosene for lamps and stoves. Since that time, inventors have developed hundreds of new uses for oil, the most prominent being the internal combustion engine. Crude oil is a complex mixture of carbon and hydrogen (hydrocarbons), which exist as a liquid in the Earth's crust. On average, crude oil is made up of 83 per cent carbon and 12 per cent hydrogen, the remainder being sulphur, oxygen and

nitrogen. The carbon and hydrogen in crude oil are thought to have originated from the remains of microscopic marine organisms deposited at the bottom of seas and oceans. Crude oil is 'mined' by drilling a hole into the reservoir rock (sandstone, limestone etc.). Often, the oil is under pressure and will emerge from the hole on its own. Once crude oil is extracted from the ground, it is 'refined' into many different products, e.g. gasoline, fuel oil and lubricants.

## Natural gas

This gaseous mixture of light hydrocarbons (including methane, ethane, propane, butanes and pentanes) is found underground in sedimentary rock formations, often in the same location as crude oil. Natural gas, the cleanest burning fossil fuel, is now widely used for space heating and electricity generation. Until the past few decades, natural gas encountered while drilling for oil was often simply burnt off, because the infrastructure necessary to capture the gas and transport it to potential users was not available. Today, natural gas pipelines are in place to serve a large portion of the industrialized world; they supply 20 per cent of the world's commercial energy needs.

## Nuclear energy

Although initially developed for use in weapons, nuclear fission has mostly been harnessed to produce electricity in the second half of the twentieth century. In 1956, in the United Kingdom, the world's first nuclear power station began functioning on an industrial scale, and the first-generation reactors are still operating successfully. These nuclear power plants can be seen as a 'clean' source of electricity because they do not emit the atmospheric pollutants given off by fossil fuel-fired power plants (Plate 95). The nuclear industry has also spawned many different technologies used in medical procedures and industrial applications. Although the benefits from the nuclear industry are great, they are not without risk, for any use of nuclear energy produces some waste that is radioactive and harmful to living creatures. The damage to living tissue caused by the radiation depends on which parts of an organism are exposed and the intensity and duration of the radiation.

## PATTERNS OF ENERGY CONSUMPTION

Energy consumption patterns show a general shift from the consumption of energy from scarce resources to those that show continuity in existence, i.e. renewable sources. The increase in energy demand has also precipitated the need for additional renewable sources of energy. Prior to the invention of the internal combustion engine by August Otto in 1876, mechanized transportation was provided by the steam engine. Steam engines using coal or wood as a fuel were used to power ships and trains; but they were too large and cumbersome for use in smaller applications. The gasoline powered internal combustion engine was able to deliver much more power from a compact design, making it an ideal match for many types of vehicles, including the automobile and later the airplane. At the present time, oil

provides the energy for over 95 per cent of the world's transportation needs. When oil was cheap, it was often used to generate electricity, especially in remote locations such as islands, which did not have access to hydroelectric power or coal. Oil was well suited for electricity generation in such applications because it is easy to transport and store. Today, oil is still used to generate electricity in many of these places, simply because the power plants are already in place. Oil-fired power plants operate in the same way as those fuelled by coal. Oil is burned, producing heat, the heat boils water, and the steam produced is used to spin a turbine. In this type of power plant only about 35 per cent of the energy originally in the oil is converted into electrical energy. The rest is lost to the environment as heat.

Oil was plentiful and cheap throughout most of the twentieth century, resulting in patterns of transportation and land use based upon the private automobile. Oil was also extensively used for heating homes and generating electricity; and since oil was so cheap, it was not used very efficiently. The world's romance with oil came to a crashing halt in 1973, when OPEC (Organization of Petroleum Exporting Countries) unilaterally raised prices and cut production. Oil prices skyrocketed, there were huge lines for gasoline in the United States, and oil suddenly became a political issue. More recently, dwindling supplies in the industrial world and concerns over global warming are also beginning to change the world's oil consumption patterns.

Renewable energy sources are rapidly becoming superior to non-renewable energy sources due to their continuing existence and environmental friendliness. Greenhouse gases like carbon dioxide are not produced by renewable energy sources, but they are removed from the atmosphere.

Renewable energy sources are readily available at a relatively low cost. Thanks to technological inventions like the photovoltaic cells, wind and steam turbines, energy from these sources can be converted into other forms, e.g. electric power. The operation and maintenance costs of such equipment are usually low. A non-renewable energy source like petroleum is the most versatile of all fuels and has found widespread application in the transportation sector because of its liquid form, high energy density, and relatively clean-burning nature. This use of oil in the transportation sector was precipitated by Otto's invention of the internal combustion engine.

## ENERGY, ENVIRONMENT AND DEVELOPMENT – A GLOBAL PERSPECTIVE

The current efficient use of energy from the various sources has led to the rapid industrialization and eventual development of many parts of the world. However, energy produced from the various sources has had both positive and negative impacts on the environment: energy from renewable sources (e.g. biomass and wood) results in no net increase in atmospheric carbon dioxide ($CO_2$), which is a greenhouse gas. This is based on the assumption that all the $CO_2$ given off by the use of biomass and/or wood was recently taken in from the atmosphere by photosynthesis. Increased substitution of fossil fuels with biomass and wood-based fuels would therefore help reduce the potential for global warming, caused by increased atmospheric concentrations of $CO_2$. The current worldwide production

of wood and crop residues for biomass is very large, thus leading to increased use of biomass and wood for fuel. This has led to significant environmental impacts, the most serious being those of lost soil fertility, soil erosion and desertification of the deforested areas. Wood-burning stoves can be a cause of health concerns in both indoor and outdoor environments due to emissions of particulates and carbon monoxide (CO). Elevated levels of CO are associated with a number of adverse health effects including decreased ability to concentrate, aggravation of heart and lung diseases and retardation of fetal growth. The use of fossil fuels has two distinct types of environmental impact. The first occurs during production, while the second occurs at the point of end use. Exploration for oil, oil production and oil transportation all have negative impact on the environment. The heavy equipment required often damages ecosystems in areas of oil exploration and production. The combustion of fossil fuels releases $CO_2$, as well as sulphur dioxide ($SO_2$) and nitrous oxides ($NO_x$), which result in acid rain. Currently, oil directly used for transportation is responsible for about 25 per cent of the world's $CO_2$ emissions. Also the incomplete combustion of oil, coal and wood results in increased levels of carbon monoxide, unburned hydrocarbons and ultimately ground level ozone. All these affect human health and the environment. The final environmental impact related to the production of oil is indirect, and related to the important role oil plays in the world economy. It is an undeniable fact that one of the reasons for high tensions in the Middle East is the value of the oil reserves in that region. It is believed that the main motivation behind the 1991 Gulf War was the world's need for reliable and inexpensive sources of oil. The Gulf War resulted in damage to the marine environment of the Persian Gulf, atmospheric pollution from burning oil wells, and damage to desert ecosystems by tanks and other heavy equipment.

## CONCLUSION

The dilemma of developing energy while protecting the environment may, in the long run, provide human beings with their best chance to reassess some old assumptions and to reorder their priorities for a safer and more pleasant life. Even before these environmental and health problems reach crisis proportions, technology is being developed that would help ensure both environmental integrity and efficient energy production and utilization. However, technology alone cannot be expected to solve problems that may also require political will and a shift in society's values and behaviour. A multi-pronged approach combing new strategies, innovative technology and a desire to ensure sustainable development will be needed.

## ANNEX – ENERGY TECHNOLOGIES AND APPLICATIONS

The development of energy technologies was precipitated by the fear of exhaustion of the present energy sources and need to increase the efficiency of energy use.[1] Solar energy technology started in 1839 with the discovery of the photovoltaic effect; below is a chronology of developments in this technology:

**1839** – Becquerel discovers photovoltaic effect
**1876** – Adams and Day observe photovoltaic effect in selenium
**1900** – Planck postulates the quantum nature of light
**1930** – Quantum theory of solids proposed by Wilson
**1940** – Mott and Schottky develop the theory of solid-state rectifier (diode)
**1949** – Bardeen, Brattain and Schottky invent the transistor
**1954** – Chapin, Fuller and Pearson announce 6 per cent efficient silicon solar cell
**1954** – Reynolds et al. report solar cell based on cadmium sulphide
**1958** – First use of solar cells on an orbiting satellite, *Vanguard 1*.

Solar energy has found widespread applications in rural electrification, electric power generation in satellites, telecommunication and remote monitoring. Energy from other sources like wind, biomass, petroleum, natural gas, and hydrogen is largely being used for the generation of electricity using wind, water and steam turbines, and generators. This generated electricity is then distributed to the different consumers using grid networks.

## NOTE

1. The following relies upon T. Markvart's *Solar Electricity*, West Sussex, UK, 2000.

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# 17.8

## CULTURE AND COMMUNICATION
## TRADITIONAL MODES AND NEW TECHNOLOGIES

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### INTRODUCTION

At the dawn of the twentieth century, Africa was caught up in rapid cultural change that found expression in different forms of communication. Traditional modes of self-expression, self-identities and cultural images were immersed in new ways of self-actualization, new communication channels, and a new search for technology, which would respond to the everyday needs of the African people. The traditional image of a young Masai long-distance runner, delivering a telegraphic message to a distant village, became a powerful tool for bringing together the old and the new. The latter was the new way of communication, the Masai runner depicted the traditional mode of communication systems.

'Culture and communication', just like 'tradition and modernity', are vast areas of research. The four key concepts in this chapter, namely: *culture, communication, technology* and *modernity*, are contested in social and human sciences. For the sake of focus, we shall restrict ourselves to a discussion that critically analyzes the concepts as they relate to contemporary social and human science theory as well as socio-cultural practice in Africa and East Africa, in particular.

Kress[1] sees a persistent tendency to separate the study of communication from that of culture. He contends that it is difficult to talk about communication independent of cultural settings. For him, 'culture is the domain of meaningful human activity and of its effects and resultant objects; communication is the domain of the intended or unintended exchange of meanings between social/cultural agents'. The processes of communication produce meanings, whereas cultural production brings in meaningful objects; the concept of meaning, Kress asserts, inextricably links these two concepts.

Another relevant argument is from Bradford,[2] who reiterates that communication is the 'foundation of all communities'. This appears to put communication on a par with culture, for one can convincingly say that culture is also the foundation of all communities. The twin themes of culture and communication are discussed in the context of that which is traditional, and the question of modern technology. A discussion of the controversies that have arisen as to what is African and what is universal in the area of both culture and technology is highlighted.

### THEORETICAL ARGUMENT

Models of cultural change, communication, and technology adoption are in agreement that there is no clear distinction between the 'African way of life' and the 'modern world'.[3] Studies by Van Tate, Mbula, and Gyekye[4] show that there are different levels of cultural interaction, and that each of these interaction levels calls for a distinct mode of communication and expression. The argument is that communication is at the core of the African 'persona'. Cultural change, at its best, is to be experienced at the periphery, where communication is by word of mouth, a song, a dance, art, or simple gesturing. This level of cultural change occurs without far-reaching ramifications. Communication, however, is more complex when one is dealing with African themes and institutions. Mbiti argues that the African individual is the personification of the past (the ancestors), the present, and the future (children yet to be born) and that these three dimensions are in constant communication.[5] He gives the example of the cultural practice of pouring out a libation when Africans perform cultural rituals. This form of communication touches on the philosophy and the belief systems of African communities, and the individuals who are involved in this intra-communication.

A further argument is the role of *zamani* (receding past) in African understanding of culture and communication. Ngugi-wa-Thiong'o walks the thin line between that which is traditional and the modern.[6] This dichotomy of the past and the *sasa* (now) belies the deep-rooted search for an understanding of the two dimensions in technology transfer.

Similar observations were made in 1973 by Bretton, who presented African rural villages and the urban centres as two different worlds that had no connection. It is now widely accepted that one cannot draw a clear distinction between tradition and modernity. Among the indigenous

groups like the Masai of East Africa or the Sun of the Kalahari Desert, contemporary lifestyle is a hybrid of traditional cultural practices *communicated* across generations and 'modern' forms of life, for example schooling and public transport systems.

## COMMUNICATION AND CULTURE IN AFRICA

Kunczik defines culture as 'that complex whole which include knowledge, belief, art, morals, laws, customs and any other capabilities and habits acquired by man as a member of society'.[7] This definition, however, omits the fact that culture is largely a function of technology and social change. It is a dynamic way of life whose constancy is that it never ceases to change, picking up certain social aspects, while at the same time shedding others. A diagnosis of African societies from the 1950s to the present shows that although cultural boundaries and distinctions among various groups still exist, there have been rigorous processes of exchange at different levels.

Culture and communication are crucial to Africa as it is mainly in these two processes that human development is embedded. Socio-economic and political development is a result of social change, which is an outcome of diffusion of information and technology. There are, however, some negative aspects through which African cultures are distorted. The glorification of Western values has tended to dispossess Africans of their cultures, thus disempowering them. This is due to the fact that in communication, there is power. Whoever has the knowledge, he/she has power over the person to whom the message is being communicated.

African scholars, poets and statesmen have responded to the power game with vehemence. The very variety and force embodied in the following ideas demonstrate clearly that African culture can respond to any power game from any part of the globe: African Personality (Leopold Sedor Senghor), Humanism (Kenneth Kaunda), Ujamaa (Julius Nyerere), Common Man's Charter (Milton Obote), Harambee (Jomo Kenyatta), Pan-Africanism (Kwame Nkrumah). The writings of Africanists Chinua Achebe, Okot p'Bitek, Ngugi wa Thiong'o and Bolaji Idowu all point out that both communication and culture in Africa can be traced to the core African values.

Culture and communication in Africa are faced with another problem. While scholars argue that African culture has been a barrier to faster economic, socio-political development, there is a counter argument that it is the ignoring of African values and belief systems and wholly adopting modernization paradigms in their place which has led to failures in socio-economic development. A critical analysis of Africa's economic and political problems reveals that African cultural practices are hardly to blame. Whereas Fraser and Restrepo-Estrada argue that for any form of development to be realized there has to be behavioural and attitudinal changes which are attainable through communication, they underscore that ignoring a peoples' cultural practices and values is a sure way of failing in development initiatives.[8]

Closely related to communication and culture are the agents through which communication takes place. The primary agents of communication are the parents and extended family. As one grows older, the peer group, the school and religious institutions step in to augment the work of the family in transmitting skills. Delanty argues that although schools and universities are seen as agents of modernity, they also nurture the dominant and emergent culture models of society. This has been powerfully expressed during the annual music festivals in Africa, where schools, colleges and universities participate to articulate cultural values through modern music. Through music, dance and poetry, powerful messages are communicated on how the past is always present in everyday African life.

Sutton argues that since each individual has a different past, the interpretation of the present is also different.[9] This is what makes agents of communication crucial in helping to understand and interpret each changing situation.

## PERSISTING TENDENCIES

The theory of cultural lag is often utilized to explain why people hold on to old practices. The lag is rooted in the tendency of societies to encourage each new generation to remain loyal to values and behavioural patterns that previously served the societies. Other arguments show that a cultural lag also exists within the moral and emotional domains, thus necessitating a delay in the techno-scientific, socio-economic development. This lag can have a negative impact on a community's attempt to modernize communications systems.

Related to cultural lag is the reflectionist argument that a society's institutions reflect its culture. This means that the type and level of communication should be a reflection of the dominant culture. At times, a combination of cultural elements may exist which, if utilized systematically, could bring about cultural evolution.[10]

Lerner and Schramm brought to the fore the complexities of culture and technology communications.[11] Using a simple model to depict the different channels of communication, they argued that the source, the message and the effect of communication are critical. What core values does the source of the message hold and do the values tally with those of the receiver of the communication? In case of a conflict of interest within the source and the receiver, what outcome does the community anticipate?

Lerner's model of communication helped communication strategists to argue for technology transfer from industrialized countries to Africa, especially to rural communities. This model, however, can only be applied if public attitudes towards support for and understanding of the importance of communication and technology are positive and independent of outside influence. The cultural legitimacy of communication, the value the community places on self-actualization, the reward for individual initiatives and self-reliance all play a critical role.

Cultural lag and communication models will not suffice unless they are seen against the backdrop of technology adoption and the diffusion of ideas. The diffusionist school argues that adoption of technology is achieved in different stages. Individuals and communities who have been exposed through media or other communication channels tend to be the early adopters. These are individuals who are high achievers, often driven by ego needs. The late adopters, who in most cases are the majority, lag behind due to lack of information, the complexity of the technology in question,

its affordability and applicability or the method used to present the technology.

A number of theories about how innovations are diffused have been utilized over the years to explain why Africa has lagged behind in technology adoption. What seems to have escaped people's attention is that communication and innovation have to be seen within a cultural context. The African adopters of technology tend to respond to their immediate needs. They have values, norms, aspirations, expectations and priorities. These drive their perceptions and give them leverage in the choices they make.

The impact of pandemics such as HIV/AIDS, political conflicts, ethnic animosities, international terrorism, extreme poverty, cannot be ignored when dealing with culture and communication. The main dimensions of culture are distance from power, avoidance of uncertainty, and collectivism. These dimensions are, however, problematic. In the case of the HIV/AIDS pandemic, the whole plethora of beliefs, the question of stigma, are embedded in culture. These are critical to both inter- and intra-personal communication on the different ways of dealing with the pandemic in Africa.

Risk-taking is another aspect of culture, communication and technology adoption. Schouten argues that uncertainty avoidance is a complex phenomenon.[12] It is a dimension that indicates people's need for predictability, and shows the extent to which people and communities are willing to take risks.

For an individual to take the risk of adopting a new technology, such motivating factors as the presence of a conducive environment, tangible benefits and upward social mobility must be in place. The argument that Africans are not risk takers finds no support in the social realities of Africa and African behaviour. Communication technology, however, goes beyond these obvious benefits and reaches levels where the intrinsic value of information comes into play.

## TRANSPORT AND COMMUNICATION[13]

The transportation systems in sub-Saharan Africa are plagued by cumbersome administrative and structural impediments, lack of appropriate maintenance and inappropriate policies for managing and regulating services. These problems hamper the efficiency of the systems as well as their economic productivity and the flow of goods and services. As a result, transport costs and delays are the highest in the world. For land-locked countries in Africa, the costs are even higher and are estimated at over 70 per cent of the cost of transit goods.

Another characteristic of transport and communication is the poor inter-connectivity between and among African countries. This is due to the absence of trans-border infrastructure, the existence of different structural and regulatory systems, low inter-country contacts and perceived differences arising out of Africa's colonial history.

The structural gap in infrastructure constitutes a serious handicap to economic growth and poverty reduction. In East Africa, the colonial powers built the infrastructure to facilitate the exploitation and exportation of raw materials and the importation of consumer products into the countries. Therefore, some of these systems do not meet the current conditions and aspirations of the African people.

Improvement of communication infrastructure would lead to the free movement of goods and services/persons. For communication to play its role and have the desired impact on the development of Africa there is a need for: physical and operational integration of networks, convergence of regulatory policies, harmonization of standards and measures, cross border operations and investments and the political will of African leadership.

The quasi-government enterprises, established at independence to run communication infrastructure, have been an obstacle to development. They are, in most cases, suffering from severe financial constraints and corrupt mismanagement, and lack the necessary strategic planning and human resources. To surmount these impediments to developing the communication infrastructure, more is required and especially financial resources, and the exploration of new and innovative initiatives. These could include private sector and community participation, the promotion of intra-Africa trade and contacts through regional integration, and the adoption of business oriented management of infrastructure.

In recent years, progress has been made in enhancing the communication infrastructure in the framework of regional integration. Examples of initiatives include cooperation in road and rail network systems, regulations and standards, the creation of regional telecommunications entities, and liberalization of air transport. However, the achievements made are still modest and more will be required to meet the necessary standards. In addition, the initiatives taken through sub-regional integration risk creating isolated and unsupported infrastructure networks in Africa unless there is a continent-wide push for inter-connectivity. Previous efforts of the Organization of African Unity (OAU) through the various Plans of Action have not been fruitful. However, there is hope, with the launching of the African Union (AU) and the New Partnership for African Development (NEPAD), that both communication and new models of technology will be enhanced.

## THE GLOBAL DIMENSION

Globalization is seen as an irreversible socio-economic, political and cultural reality that does not create a unified global culture, but rather sets the stage for global differences.[14] However, the irreversibility of the globalization process has an impact on the relationship between communication and culture at the local level, shrinking the world and promoting the emergence of a 'global village'.[15] Globalization implies a departure from a traditional local way of understanding issues through a national perspective to a more accommodating global view. In orthodox anthropology and rural sociology, a traditional worldview is characterized by archaic ideas, indigenization of knowledge, narrow-mindedness, and adherence to customs and cultural norms. Based on this thinking, Robert Redfield came up with the folk–urban dichotomy.[16] This distinction would signify that globalization is a shift from the traditional village communication mentality to global thinking.

The polarization of traditional and new communication technologies is not tenable since many features of traditional channels of communication are carried on via the new channels. What seems apt is that a shift from traditional to global produces a continuum where individuals, communities

and nations are placed at different levels along the technology path. As such, African countries may be seen as ranking on the lower end of the technology continuum than the new industrialized countries while the developed countries rank highest. Within this differentiation there is interdependence among the different actors as is evident in the world system theory where it is inevitable that the core cannot do without the periphery.

## NEW TECHNOLOGIES AND COMMUNICATION FOR CHANGE

The question of whether or not Africans can participate in the generation of knowledge and in applying it to solve Africa's technological needs is not only critical, it is urgent. However, the talk of 'new technologies' raises fundamental issues – notably the question of time and space/context. Some technologies considered 'new' in Africa are old or irrelevant elsewhere. Furthermore, Africans have not been mere consumers of foreign technology. They also reject what is new or modify it to suit their own needs. Africa's 'informal sector', where all manner of affordable metal gadgets are made, attests to an entrenched culture of technology. Like the blacksmiths of the past, the contemporary African artisans are innovative. They operate their Kiosks in the *jua Kali* (hot sun) and produce communication tools which are accessible and affordable to local communities. Where necessary, they modify mechanical and electrical equipment or use it as a model to produce what suits local needs and levels of income. In other cases, some of Africa's indigenous technologies like the artistic 'Makonde' woodcarvings from the United Republic of Tanzania, and arts and crafts from Kenya and Benin, have found space on many shelves around the world.

The emerging knowledge societies are not a new phenomenon. Indigenous technical knowledge in Africa has served local communities over the years. The provision of distance education through the Internet to the Masai of Kenya or the rural populations of Senegal (University of Massachusetts Project 2002) is a response to a need for lifelong learning. The Internet is providing people an opportunity to reach out to the global village. Responding to the Internet explosion is the challenge facing rural communities. The infrastructure is inadequate, and yet United Nations Secretary-General Kofi Annan argues that it is indeed in places where infrastructure does not exist that Wi-Fi can be particularly effective helping countries to leapfrog generations of telecommunications technology and infrastructure and empower their people.

The sentiments expresses by Kofi Annan highlight the centrality of information technology for the construction of knowledge societies. New technologies have, however, to be flexible so as to be utilized hand in hand with traditional knowledge.

In the area of technology communication, sub-Saharan Africa consists of countries in transition. Economically, they aspire to industrialize, while politically, more democratic institutions and practices are evolving. These countries are at a crossroads, caught between 'Western culture' and what is branded 'African' perspectives.[17] Due to the deep-rooted notion that what is foreign or Western is best, many Africans often do not regard indigenous innovations as new. An example would be the African herbalists who come up with new medicines but who find few people to adopt them; and those who do, usually do so due to inability to afford what is perceived as better alternatives dispensed by chemists.

## ADOPTING TECHNOLOGY

A closer look at African societies over the last 50 years shows that as society progresses and new technologies emerge, there has been a change in the way people communicate and pass on information. Many urbanized Africans today have an email account, and cyber cafes are found in many urban neighbourhoods. Communication through email within Africa and without has become an everyday occurrence so that sending fax messages has been reduced drastically and, as in the West, fax machines are almost obsolete. Despite the fact that only a few Africans enjoy these services, it would be naive to argue that only a small proportion of Africans lead a culture of technology.

To a large extent, Africans have not simply switched from traditional modes of communication and technologies to new ones. Apart from the disparities in the level of adoption, most actors are at certain points of transition; there are no pure traditionalists or modernists. And in many cases, modernity enhances tradition and by extension, indigenous knowledge. For instance, public transport systems and mobile telephones have become useful among Africa's pastoral groups, assisting them to identify sources of water and pasture as well as locating stolen or missing livestock. External interventions have often adopted existing practices to enhance effectiveness and sustainability of implemented projects. Micro-finance enterprises in Africa which enjoy the support of the World Bank and bilateral agencies often prefer giving credit to groups where each member acts as the other's guarantor, thus providing a social control mechanism (a good example would be the Kenya Rural Enterprise Programme, which has been transformed into a bank). This kind of arrangement, which works relatively well, is rooted in traditional values of reciprocity, mutual social responsibility and accountability.

Another case where the traditional blends with the modern is the Rehabilitation of Earth Dams in Eastern Kenya, a programme funded by UNESCO. Local communities are being given information on international standards of water and sanitation. However, the local women's groups continue to believe that the female water goddess Kathambi preserves the hills that supply the streams with water when it rains. In addition, the leaders of Kathambi demand that the impermeable wall of the sand dam should provide a small hole to allow water to trickle downstream. The argument is that if there is no hole to allow water to trickle down, the people, animals and environment downstream will suffer.

Thus while modern technology in the construction of water dams is concerned with lateral and backward recharge in the river channel, the indigenous people are concerned with the community values of sharing both water and technology. The dichotomies of new and old, traditional and modern, global and local are tools for theoretical arguments. The reality in most of Africa is that the continuum is enriched by the interaction between the organization and the source of information, the communication channel, and the adoption of the technology.

# RE-ENGINEERING AFRICAN TECHNOLOGIES

This chapter is an argument for communication of technology in Africa. This is discussed along a continuum running from traditional communication to modern systems. The nagging question is whether there is any technology that can be termed modern and how long it maintains its newness. In the early 1950s, when most of Africa was struggling with political independence, communication of technologies was localized but was found to be effective and efficient. During this period, Africa achieved, against all odds, major strides in democratic development, and political independence attests to this. The simple technologies, the infrastructure, the channels of communication, worked in harmony for the common good. New technologies, though far advanced and faster than traditional systems, have neither relieved Africans of poverty, nor responded adequately to development needs. This explains why there is an urgent need to re-engineer traditional technologies that have served the people well over the centuries. One positive move came towards the close of the twentieth century, when African leaders, led by President Thabo Mbeki of South Africa, started arguing for an African Renaissance. The move to reclaim African values, to rediscover the values of the people, their artistic contributions, the resilience of communities and the people's capacity to respond to harsh environments is not only challenging but heart-warming for Africanists. The radio, the fax and now wireless communications have taken Africa by storm, but they are no longer new. Radio is one mode of communication that has permeated life in rural communities in Africa. It is the medium through which governments communicate with the citizenry. In a rural African village any 'news' is likely to have been transmitted by radio and then spread across the ridges and valleys through word of mouth, marking again the interaction between the 'new' and the 'old'.

The re-engineering of technologies means that Africa has to look at what has best served the African communities. An example concerning village banks, given earlier in this paper, can be used to show how international banking could set down roots in African wealth-saving systems, and the need to support communities' initiatives. Taken together, the management of the village banks, the levels of communication and the villagers' coherent articulation of their financial needs, put forward a strong argument for re-engineering traditional financial savings and similar technological institutions.

The global landscape presents a challenge to efforts at re-engineering. Africa does not act in isolation. Whatever happens in East Africa will impact on the rest of Africa. This interconnectedness of countries means that there must be sensitivity in the way that one deals with externalities. The market transactions between the producer, the seller and the buyer of farm products have to be situated, the level of communication agreed upon, and the type of technology presented has to be affordable.

New 'foreign' technologies may at times be alienating to the African people. The digital divide is already a big issue. While a segment of society is concerned about the digital divide, it is imperative also that we become sensitive to the priorities of the people. These priorities will help the majority of African people to surge forward and adopt new technologies or innovate their own. What is at stake is the combining of traditional and new communication strategies to support the emerging initiatives and create a synergy that allows Africans to participate in the global arena.

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# 18

# THE SOCIAL CONSEQUENCES OF SCIENTIFIC AND TECHNOLOGICAL KNOWLEDGE AND PRACTICE

*Dominique Ngoïe-Ngalla*

The relentless efforts of the West – with its roots deep in the eighteenth century and its unquenchable thirst for knowledge and discovery – to know and transform nature have not been in vain. It is fair to say that these efforts, made in all fields of knowledge, have been amply rewarded over the past 200 years (indeed increasingly with each generation) and particularly in the astounding twentieth century. In certain areas of research such as genetics, transport and information, progress has been breathtakingly rapid. Researchers and scientists have recapitulated the theories and findings of the preceding two centuries and subjected them to the requirements of a new epistemology and a new rationality. This has opened up an era of unprecedented scientific progress and technological innovation with tremendous social consequences in the fields of economics, politics and culture. All aspects of social life are being affected by an irreversible drive to destroy and restructure from top to bottom. Quite clearly, a civilization is dying and a new one is rising from its ashes and developing with such speed that, in a few decades, our current civilization will seem to belong to a bygone age. And there is every reason to believe that the transformations taking place – be they magnificent and precisely as we had hoped or obscure and disquieting – are only just beginning.

This future, which is almost upon us, this age-old dream of humanity, will probably be perilously complex, since the sciences and the technologies that embody them are raising very disturbing questions, for which we often have no reassuring answers at present. In a world of unprecedented political instability, will we be able to come to grips with and control such a future? Given the uncertainties of a world that is wholly in the power of a science that seems to raise more problems than it solves, both calm optimism and deep pessimism would be irresponsible attitudes. Science is the only weapon with which we can confront our future in all of its diverse forms – demographic, economic, political, cultural and social. It can be our salvation or it can lead us to our doom. And for as long as the history of humanity continues, this is how things will be.

With such an accumulation of extraordinary scientific knowledge and know-how, and prodigious technological innovations introduced at an increasingly faster and frightening pace, the twentieth century seems to have fulfilled Descartes' prophecy: 'Man as master and possessor of nature'. There is, in fact, not a single field of human knowledge and practice that has not been explored by science and technology, and as a result of this scientific scrutiny, our ideologies and our old representations of the world and our relation to it have been overturned. The epistemological revolution of the twentieth century, which concerned every field of knowledge – physics, chemistry, mathematics, the agricultural sciences, the life sciences, transport and communications – brought about social and sociological changes on an unimagined scale.

Let us take the example of politics, said to be the most effective means of changing our lives. Politics entered the twentieth century on a fast-moving current of profound change, responding to the economic and social upheavals brought about by science and its technological applications. The most striking example certainly remains the terrible confrontation of capitalism and communism, ending with the collapse of the latter under the growing pressure of liberal economics and democracy. Even in the countries where liberal democracy was already present, it was continually being redefined and restructured in response to the demands of an ever more enlightened public and a better-organized populace. Liberal democracy was continually searching for a new political, economic, cultural and social rationale capable of responding to the ever-growing demands of modernity. Its impact on the entire world has been undeniable. Under its impetus a true wind of freedom is blowing around the world, which, despite differences of political regime, is more and more being caught up in the mesh of the economic system of the liberal democracies.

The pressure and the demands of the new economic and commercial forces have gradually broken down the resistance of states, even totalitarian ones, and led to the interconnection of economic and commercial interests the world over. Known by the simple term 'globalization', this extremely complex phenomenon has resulted inevitably from the advances in the field of communication. It is the economy of the global village, which is not without international political implications, since economics is never unaffected by politics.

The multinational companies, which seem to abide by their own laws and can stand up to any government on political issues, have brought all their weight to bear here. Soviet *perestroika* and the collapse of the Berlin Wall would be inexplicable without the pressure brought to bear by the capitalist regimes of the West and the multinationals.

Economics is the driving force behind everything. The sovereignty of states (the exercise of authority on their territory and the right to the monopoly of that authority) is challenged by the fact that there now exists a World Trade Organization (WTO), which has wide powers over states in the area of trade. In addition to the WTO, international law and international justice, whose decisions prevail over those of local courts, further limit the sovereignty of states.

And let us not forget international legislation on human rights! International treaties and the United Nations prohibit states from doing what they please with the lives of their nationals, prohibiting genocide, torture and massacres. Thus the globalization of the world's economic interests, unimaginable without the progress of science and technology, is compelling all states in the world – over and above their ideological and political divergences – to maintain relations based on a consensus about non-negotiable, universal values such as equality of the sexes and racial equality, a need justified by the brotherhood of all men, born equal and facing a shared future. The old order, as we can see, has entered upon a process of drastic change unlikely to be halted by the attendant identity crisis in the cultural and political spheres. In this general commotion, which reflects a fierce desire for a better life, the return to identity is merely a weapon, the signal that justice has often been sacrificed in the name of the law.

## THE STRICTLY SOCIAL FIELD

The changes that have occurred in the strictly political field are simply the consequence of the upheavals in the economic system and the social order brought about by science. If society is regarded as the way of life of an organized body of individuals, economic transformations have drawn it into a process of change on such a scale that one has to call it a revolution. This revolution marks a complete break with the preceding age in regard to standards and systems of values, morals and attitudes, with increasing importance attached to comfort and pleasure. A new civilization is coming into being, a civilization celebrating the body and striving to improve the social and material environment.

In the countries and regions of the world that have given themselves the means, development has become a reality, enabling them to realize the age-old dream of humanity. Civilization, defined as an environment of technical facilities in which people can meet all their needs in respect of health, housing, clothing, food and leisure activities, has become far more accessible to people of the developed world. In a few decades, the social scene, particularly in the West, has undergone a metamorphosis. In an increasingly urbanized society, people are better fed, better housed, enjoy better health care, have improved access to education and culture, especially as the authorities endeavour to give opportunities to all, rich and poor, city and country dwellers.

As a result of the fantastic development of communications and the media, the volume of exchanges and of interaction between people is continually growing. With distances so remarkably shrunk, the Earth is being reduced to the size of a big village where everybody knows each other. When all is said and done, people are clearly leading incomparably easier lives than their ancestors did for thousands of years. With increasingly powerful means, what limits are there to what we could achieve or how far we could go? The exploration of space and the Moon landing confirm the boundless power of human genius and foreshadow still greater exploits to come. This is what lies ahead for the countries known as those of the North, the most highly industrialized and thus the richest in the world – the United States, Western European countries, Australia, Japan, Taiwan, China and Singapore. These countries' human development indicators (HDI), gross national products (GNP) and gross domestic products (GDP) are incomparably higher than those of the largely unindustrialized countries of the South, or the Third World. A study by continent shows, for instance, that 92 per cent of the world's GDP is concentrated in Europe, the United States and certain Asian countries such as China, Japan, Taiwan and Singapore.

The contrasts between the two extremes of civilization are no less striking when average purchasing power and per capita income are taken as criteria. It is clear that at the present time, only a small portion of the globe has benefited from science and technology, which are thus still a long way from having solved all the problems facing humanity (in fact, they appear to be raising many more). There is a reverse side to progress, which requires people to show greater wisdom and to make better use of science and technology if they wish to avoid disaster. If we want nothing but amazing development tools, science and technology could become a terrifying Pandora's box.

## THE OTHER SIDE OF PROGRESS

Such a sudden concentration of tremendous power and means in the hands of people who are ill-prepared and liberated from discredited moral and religious taboos does not occur without serious risks, since the sense of duty required to cope with the new social codes has not kept pace with science and technological innovation. Having become a true demiurge (and very much aware of it), humanity has begun to show that it will not always keep to the boundaries, especially since it must now define what is licit and illicit as pertains to ethics and morals.

In the field of biology, for example, the discovery of DNA, while contributing in a beneficial way to medicine, criminal investigation, justice, etc., tempts the scientist, who is freed from metaphysical or religious taboos and prohibitions, to proceed with a certain kind of genetic engineering that could have dire social and human consequences. To confine ourselves to a sector in which genetic engineering is on the face of it unlikely to raise philosophical or ethical problems, the genetic modification of foodstuffs, the genetic modification of foodstuffs and living organisms, including transgenic plants and animals (those modified by recombinant DNA methods) has already become, in many quarters, a controversial issue with far-reaching economic, social and political repercussions. This contentious issue demonstrates that genetically modified organisms expose humanity to many aberrations and many risks if barriers are not raised.

However, now that science has become a kind of divinity or an absolute domain pursued for its own sake rather than a means of action, its fascination and attraction is such that it is hard for people not to break religious and moral taboos, the justification for which they alone can establish now that many believe that God is dead. With just the light of reason to guide them, who will now forbid scientists to pursue a discovery unlikely to be of benefit to humanity? With omniscience, or the arrogant illusion of it, there is a very great temptation to stop at nothing, the limits of what is possible now being defined by the scientist alone, with God or morality no longer in the picture to set limits. 'Aspire not to the eternal, oh man, but exhaust the field of the possible.' This invitation to excel oneself by an atheist poet freed of all taboos is the only counsel heeded by some modern scientists.

However, new knowledge and technological innovations are continually appearing to exhaust the field of the possible and stimulate the obsessive pursuit of knowledge and know-how towards an ever-receding horizon of unknowns. At the present increasing rate of scientific progress, the most revolutionary technological innovation remains so only for the short space of time it takes for another to supplant it. Consider the explosion of communication technologies between the 1970s and the 1990s, with the computer, the microchip, then the Internet. It all happened so quickly! This endless and constantly accelerating progress is giving rise to new forces, new rationales and new frames of reference in the economic, social, cultural and political spheres. Nothing is stable any more. Today, humanity is facing an unprecedented crisis of civilization, which is systematically challenging the principles and standards on which the world of the past relied. Our survival thus now depends on our capacity to devise other principles and other standards, other rites of passage, for a transition that is likely to be turbulent.

If humanity does not hold on to some kind of wisdom value system (yet to be devised) to protect itself from the threats and dangers to which its own industries expose it, this may constitute a threat to its survival in a world made dubious about its future direction by the headlong progress of science and technology. Many natural disasters such as droughts and floods have occurred. Many disastrous ecological disturbances have also occurred (the famous hole in the ozone layer and the greenhouse effect), and the atmosphere is said now to contain 25 per cent more carbon dioxide than it did before the industrial era. In the absence of any realistic answers or effective countermeasures, such changes could have far-reaching consequences in the short term, e.g. climate change with 1–4 °C temperature increase and a rise in sea levels. These are all nature's brutal response to the failure of humanity to conform to the standards that link it to nature. They are a response to the sluggishness of humanity to fully comprehend the dangers that modern science enables it to foresee. Crises, with their characteristic instability and rift, are to be dreaded since they can lead to regression if people do not take carefully thought-out action. With the increased means for action at our disposal, the wise course in the case of a crisis such as we are experiencing would be to awaken to our human vocation and act accordingly, moderation in all things remaining the great normative principle on which individuals must set their lives and their action.

Unfortunately, the flood and clutter of the material aspects of post-modern industrial society are distancing people from this rigorous ethical principle and leading to a disorderly and hedonistic consumer society. Today's consumer society is striving to achieve a veritable subversion of the established order. The slogan of the new ethic is: 'Down with boredom! Enjoy life unfettered!' When it comes to eating or drinking, everything has become immediately accessible providing that one can pay. Similarly, in the field of the libido, there are no prohibitions or taboos. Humans are in a way reinventing the world as a world for which they are entirely responsible, thereby lending credence to the notion held by some Westerners that God is dead.

Growth is the reference point of the new economic and social system. Its prime objective being to achieve a steady increase at all costs in production, incomes, employment and investments, it gives rise to a hedonistic society in which the requirement to continually create new needs is met by the obsession to enjoy and to consume. A spend-and-waste type of capitalism is replacing the work and thrift capitalism of the nineteenth-century middle class. The result is an incapacity to act in accordance with one's values – abhorrence of slavery, emancipation of the whole of humanity, and solidarity with the most deprived. The aid provided by the wealthy countries is insufficient. Some of these same countries provide support for Third World despots who sometimes end up as their henchmen in the exploitation of barely subsisting populations. Nearly 1.3 billion people are living in absolute poverty, and every year 40 million die from hunger-related illnesses, which could quickly be eradicated with good will. At the global level, it is not a question of insufficient production, but of poor distribution of food resources. Malnutrition in the world is thus one of the least excusable injustices, and the assistance provided by wealthy countries is clearly insufficient.

## THE WIDENING GAP BETWEEN NORTH AND SOUTH

A comparison of the HDI, GNP and GDP of developed and Third World countries reveals differences that leave one perplexed. Given the recurrent disorder in which most Third World countries are mired, together with their heavy indebtedness (the total they owe to the countries of the North exceeds the value of the aid that the North grants to them), the gap will probably never be closed. At present, it is widening and will not be narrowed by the current growth patterns and constraints of the economies of the North. For things to be otherwise, the Third World countries would have to receive steady, better-conceived and more generous assistance from the countries of the North by means of a kind of Marshall Plan. Unfortunately, owing to the egoism of the affluent countries, it will not be easy to set up such a plan for a long time to come. The countries of the North already find it hard to keep up with the United Nations, which asks them to set aside just 0.7 per cent of their GNP for development aid for the poor countries.

Moreover the HDI, GNP and GDP of rich countries would probably not be at their current level if the poor countries did not supply their industries with raw materials at such low cost. For this reason, rich countries keep a watchful eye on the poor countries that possess strategic raw materials such as gas, oil, manganese or uranium.

*Table 9* **The gap between rich and poor countries**
*(per capita GNP expressed in US$)*

| Country | per capita GNP |
|---|---|
| Luxembourg | 41,866 |
| Ethiopia | 105 |
| Switzerland | 41,411 |
| Mozambique | 100 |
| Denmark | 29,890 |
| Sudan | 270 |
| Norway | 31,250 |
| Chad | 179 |
| France | 24,990 |
| Burundi | 160 |
| United States | 27,647 |
| Malawi | 189 |

The development and the comfort produced by science and technology have not really uplifted the human mind to a more humane attitude. There is extreme poverty in the world, and it is growing even within the Western world, where the existence of pockets of wealth and unprecedented material abundance does not prevent more than 10 per cent of the population from suffering from poverty. It is also in the West that some persons who have become unemployed as a result of the increasing robotization of some sectors of industry or the decline of agriculture in favour of the industrial sector, end up homeless, abandoned to their own resources, and find themselves in a situation of physical and moral degradation unknown to even the poorest inhabitants of Third World shanty towns. All things considered, poverty in the rich countries is negligible and not so alarming compared with that of the developing world. In Third World countries given over to unregulated exploitation by the wealthy and major powers, poverty and destitution, glaring and unending, are incommensurably worse. None of this is new, of course, but with the advent of globalization and mass tourism it has assumed an extraordinary worldwide dimension. Drug trafficking and prostitution, taken over by powerful networks of organized crime, are born of poverty and destitution. The countries concerned are naturally the poor countries of Africa, Asia, the Caribbean and the former Soviet republics in Europe.

The loosening of the bonds of solidarity that are a hallmark of well-integrated, hierarchized and ordered societies is a manifestation of modern society's rejection of the values that it has considered fundamental until the present time. Modern egalitarian society, with its faith in work, material well-being and freeing people from the bonds that tied them to restrictive moral codes, is centred on self-assertion and self-interest. The social repercussions of such a choice are considerable – growing individualism, the break-up of the traditional family, and the search for a new ethical code and morals consistent with the new socio-economic context. These changes are unnerving for many people because the traditionally reassuring landmarks have disappeared.

## Individualism

On a strictly individual and personal level, by establishing a society with strong hedonistic tendencies, the new economic transformations stimulate a perfectly legitimate desire for personal fulfilment, which threatens to lead to individualism. Far from being subjected to external laws or standards, individuals constitute their own standard and purpose in life. The rise of individualistic values that emphasize the freedom and autonomy of all people is demolishing the barriers of rigid standards. The rise of individualism is clearly a threat to the traditional family, the very foundation of social order. The pressure of combined economic, demographic, scientific and cultural transformations is fragmenting its traditional framework and patterns. Emerging at the end of a long history of social, moral, religious and legal victories, the individual is at last savouring the pleasure of 'self-possession'. However, this autonomy comes at a price – solitude and the loss of the meaningful horizons that used to govern life. As everyone knows, when there are no bonds with other people, life loses all meaning. There is no life without connectedness as Durkheim demonstrated in his thesis on suicide.

## The family – break-up of the traditional patterns

The democratization of the family, the demand for autonomy and its corollary, the general freeing of morals, are leading to the redefining and restructuring of traditional family ties. The shadow cast by the patriarch is gradually receding, and more room is being left for each individual's choice and self-expression. The direct consequences are a high divorce rate, the prevalence of unmarried couples, late marriages, and the advent of the limping, reconstituted family. Issues concerning the family are becoming increasingly complex owing to scientific advances in areas such as intervention of science, medically assisted reproduction, and sperm donation. In all these instances, the biological bond no longer coincides with the affective bond. Owing to their obscuring of affiliation, genetic manipulations may lead to a large number of lawsuits. Further down the line, this break-up of traditional family patterns could have repercussions on the exercise of authority in the school, in business and in all centralized institutions, thereby sounding the death knell for rigid, established hierarchies.

## Morality and religion – the collapse of the foundations

In a society given over to frivolous expenditure and waste, in which the pursuit of pleasure has become a priority, moral convictions can weaken and, under the pressure of scientific progress, belief in the supernatural, in another world with which we can communicate, is shaken. Faith begins to waver. Church attendance falls off against a background of growing religious indifference, offset, however, by the proliferation of sects in which freedom of expression, fervour and exuberant rites help to drive out the anxiety generated by the questions that science has left unanswered. It is against this backdrop of the collapse of Christianity and the metaphysics derived from it that the New Age

Movement, which is trying to reconcile science and faith, the subjective and the rational, has appeared. The results do not seem convincing.

Where morals and law are concerned, the genetic revolution that is opening up so many new avenues for medicine and justice (e.g. DNA fingerprinting) is disturbing since it makes possible the deliberate manipulation of life. Moreover, it calls for the drawing up of a new code of ethics and new laws. And where might the unfettered freedom of the Internet be leading us? How can children and young people be protected from the shocking or illegal things that it makes available? From the global, strategic point of view, the fact that the main non-renewable sources of energy (oil, gas) needed by the industries of the major powers are in the countries of the Third World is giving rise to merciless competition for their control and causing a growing number of local wars, thereby increasing the risk of worldwide conflict.

What the poor countries need is encouragement for endogenous policies, which, by stimulating local industries, would prevent globalization from covertly expanding cultural and technological heritage of the countries of the North. Moreover, such aid would spare the poor countries the present alarming brain drain – a phenomenon that paradoxically reverses the direction and the process of aid since, culturally and scientifically speaking at least, this type of aid goes from the poor countries to the rich!

## CONCLUSION

We are living through a time of crisis, a distinguishing feature of which is the eruption of new values that are bringing about far-reaching social change. There are changes in basic matters such as dress (jeans phenomenon), diet (the spread of McDonald's), the family, relations between the sexes, life in society, and childrearing. The advantages of modernity are undeniable. It is quite clear that scientific progress has improved our living conditions. However, valued means of deriving pleasure, scientific inventions and technological innovations also bring with them serious questions and concerns since it is still impossible to discern clearly what the future holds for humanity. And will it ever be possible?

In any event, suffering on a tremendous scale and injustice subsist. Injustice is even more serious in that it can now call on powerful technical resources. Boosted by scientific progress, the inordinate ambitions of people not always aware of the risks involved are frightening. Should we give up then? We know, however, that we cannot halt progress. It therefore remains for us to try to humanize progress, endowing it with ever more meaning that gives people grounds for hope in a beneficial alliance of knowledge, science and justice. In this way, progress and development would not only be a process of accumulating material goods, but also a process of adding a spiritual dimension to human action.

This would give meaning to the idea of progress and justify it. Without such an ethical aim, progress would indeed be meaningless and would pave the way to injustice, unemployment, war, stress, and poverty and, given the risks of self-destruction inherent in the uncontrolled use of technology, enduring anxiety.

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# THE DISCIPLINES OF THE SCIENCES OF SOCIETY

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## INTRODUCTION

*Peter Wagner* and *Björn Wittrock*

### THE EMERGENCE OF TWENTIETH-CENTURY DISCIPLINES

The dawn of the twentieth century witnessed a major restructuring in the social sciences – or rather, what is now known as the social sciences, since at the time, the term did not yet refer to the disciplines dealt with in this chapter. In some cases, fundamental transformations of approaches gave rise to the contemporary state of the disciplines. The *marginalized revolution* set the theoretical agenda for much of twentieth-century economics as the structural approach did for linguistics. In anthropology, the introduction of participant observation gave the field its methodological distinctness – comparable to stratigraphic excavation in archaeology, which was introduced in the nineteenth century. In sociology, the turn of the century, known as the 'classical' period, was characterized by a set of epistemological, methodological and political reflections which, taken together, constituted a discipline barely recognized by the period's academic institutions.

Such transformations, however, did not leave the other fields of inquiry untouched. Often, these transformations entailed a specialization or a more precise delineation of the area of expertise, which then demanded a new way of dividing up the entire intellectual space devoted to the study of social life.

Some of the older disciplines had been rather clearly and easily defined by their relation to social practices and institutions during the nineteenth century. Historical accounts of the development of national states commonly reflect a large dose of patriotism and nationalism. The field of law interpreted, systematized and justified national legal systems and trained their practitioners. The state sciences – now often considered the forerunner to current political science – aimed at a comprehensive approach to problems of governance and policymaking for the existing policies. In addition, geography and demography provided data on the state's territory and population.

While such practice-related tasks persisted, scholars in these fields felt the need to define their work more precisely in academic terms at the beginning of the twentieth century. Partly following the example of the natural sciences, which

greatly developed during the nineteenth century, partly responding to broader transformations of the university system, which re-emerged as the institutional locus of systematic research, social scientists devoted much energy to developing a scholarly definition and demarcation of their fields, be it through disciplinary treatises, such as for history and geography, or through the choice of theoretical foundations such as legal positivism in law or the theorem of the optimum population in demography. Significantly, despite the attempts made, state/political scientists did not achieve a recognized degree of disciplinary consolidation in similar form (except in the United States), and the area lost influence in relation to other disciplines, notably economics and history, but also sociology, until it re-emerged after the Second World War.

It is possible to state (with some significant reservations) that the set of disciplines of the social sciences, as we knew them at the end of the twentieth century, had barely emerged at the beginning of the century. However, at that time, it displayed a number of characteristics that should come under critical review in the course of the present century. First, the organization of the social sciences occurred as a 'local' model developed predominantly in Europe and North America. Second, it emerged as a set of academic disciplines, i.e. with an intrinsic idea of a cognitive order for the comprehensive study of the social world. Third, it was conceived as a set of 'sciences' in response to the period's prevailing crisis of science. In the present introduction, we shall briefly survey the development and transformation of these three features through the twentieth century.

### RELUCTANT GLOBALIZATION AND PLURALIZATION

Around 1900, considerable efforts were made to establish the sciences of society as international intellectual projects. An international institute for sociology was founded; historians started to convene international conferences; and in some areas such as economics or archaeology, the scholarly debate had become truly transnational. Furthermore, national European traditions in the social

sciences were spread across the globe through conscious attempts at adaptation (in Japan, for instance) through colonial domination as well as through migration and commercial encounters.

However, all of these developments must be understood against the background of profoundly national structures of scholarly work. During the nineteenth century, national intellectual traditions had consolidated like fortresses in Europe, created and sustained by national university systems and ideologies of nationalism. Denominations such as the French school of sociology for Durkheimian thinking, or the German school of economics for historical-institutional economic analysis were quite common. And the sincere attempts at internationalization were largely thwarted by the outbreak of the First World War.

During the interwar period, the late-nineteenth century situation of a plurality of competing national intellectual approaches, mostly confined to Europe and North America, was restored. The main difference was that the prestige of German academic institutions was gradually waning and that American social science started to emerge more strongly. These tendencies were strengthened by the advent of fascism, totalitarianism and war. Many German and Central European scholars, often of Jewish origin, fled, sometimes to France, the Soviet Union or Turkey, but more often they found a long-term, and often permanent home in the United States or in the United Kingdom. As a result, the European limited diversity of social science was replaced by what appeared, at least superficially, as a temporary American hegemony after the two world wars.

Following the Second World War, however, another immense shift in the global intellectual structure could be observed. From the 1960s onwards, the then-dominant social science approaches – often regarded as 'American', especially by non-Americans – were increasingly criticized, and intellectual traditions from so-called non-Western cultures asserted themselves more strongly in increasingly global multicultural encounters. In addition, some European traditions were also revived. The return of the anthropological perspective on Western societies, the final farewell to racist theories of the development of humankind in archaeology, the focus on linguistic pluralism, or the critique of legal positivism by postcolonial theories of law are examples of such developments.

## DISCIPLINES AND INTERDISCIPLINARITY

The formation of the disciplines that accompanied the revival of universities was generally a nineteenth-century process. At the beginning of the twentieth century, universities were increasingly organized according to disciplines, and both universities and disciplines had achieved some degree of institutional autonomy and intellectual consolidation. The disciplinary structure, however, was unevenly and inconsistently constituted, in the social and natural sciences alike.

It remained unclear whether social science disciplines were defined by subject, methodology and theoretical perspective or by reference to an area of practice or a profession. Anthropology, for example, differs from sociology by subject matter, i.e. the study of non-Western societies. This can be done, however, only at the cost of making the distinction between Western and non-Western

societies a fundamental one, which hardly anybody in either field today would wish to uphold. Perhaps the distinguishing quality of anthropology is its methodology involving extended participant observation. In that case, however, applying that method to political or economic phenomena in post-industrial societies would expand the sphere of anthropology at the expense of economics or political science. Similar illustrations could be given for all disciplines and all distinguishing criteria.

Today, in all fields of study interdisciplinary approaches are adopted from the outset. There are sociological approaches to law, economic approaches to demography, linguistic approaches to history, etc. By the end of the twentieth century, the strictly disciplinary structures were largely eroded; intellectuals focused primarily on questions that could often not be addressed by means of disciplinary theories. Furthermore, there were increasing expectations for social research to solve social problems and, accordingly, new institutional elements were introduced within university systems. As a result, much research examined socio-political problems, and often centred on state policy issues rather than disciplinary theory. In some fields, most notably in economics, this tendency led to marked distinctions between 'pure' and 'applied' social analysis, the former remaining disciplinary while the latter became either empirical or oriented towards ad hoc theorization with little concern for disciplines per se.

The current situation can probably be best described as hybrid: disciplinary traditions remain important at the universities for purposes of teaching and training, while there has been a shift of intellectual activity to areas where disciplinary approaches intermingle and are sometimes eliminated.

## SOCIAL ANALYSIS AS A SCIENCE

At the beginning of the twentieth century when many disciplines were taking shape, the issue of social analysis as a science was much debated. The era was characterized by a reorientation – sometimes leading to open crisis – in the natural sciences, away from a realist-representational vision of science towards a relativist-pragmatic perspective. Those involved in the emerging social sciences raised the question of whether they should, and still could, follow the nineteenth-century natural-science model or whether the new characteristics of society called for a different but equally scholarly approach.

Thoughts on those issues can be found in virtually all debates concerning the constitution of discipline around the turn of the twentieth century. The 'dispute over method', which started in the 1880s, to give one prominent example, dealt directly with history, economics and sociology and included epistemological and ontological as much as methodological issues. Despite the fact that the debate originated in Germany and Austria, it was widely followed and taken up in other countries.

For social analysis to be recognized as a science at that time, it was important either to agree on some necessary philosophical foundations for those projects or to strongly limit, or eschew entirely, such concerns by focusing on methodology. It was evident that the social sciences shared some characteristics with philosophies of history and anthropologies of human social life. The question was whether they could be formalized to such an extent that

they created theoretical research programmes (which occurred in the field of neoclassical economics) or whether they could be discarded in favour of empirical research strategies. To some extent, the latter took place, for example, in the field of history with the focus on archival research, in anthropology with the invention of participant observation, and in archaeology with the invention of radiocarbon dating.

For most of the other social sciences, quantification of social data appeared to provide the best solution for this problematic. Quantifiable data, in a nearly ready-to-use form, could be found in state-provided statistics or could be generated through surveys. Much methodological effort was devoted to the development of increasingly sophisticated techniques for treating those data. Beginning in the interwar period, quantitative social science reached its heyday during the 1960s, by which time it was extended to virtually all disciplines and sometimes equated, critically, with the American approach to social science.

By the end of the century, however, all of the once-pressing questions that appeared to have been answered returned to the fore. On the one hand, the implicit anthropology of 'modern' social sciences was questioned from a humanist perspective with a view to underlining differences between the natural and the social world and advocating a renewal of interpretive approaches. On the other hand, the philosophy of the dominant social sciences (and of the natural sciences as well) was criticized for pretending to work from secure foundations that can not be validated. The outcome of this situation is not a denial of the validity of social science (or of science in general) – though some current observers are worried about any such implications – but rather a renewal of the mixture of scepticism and pluralism that marked the end of the

nineteenth century. If nothing else, these most recent developments demonstrate the liveliness and creativity of the intellectual debates in the realm of social sciences, and there is every reason to believe that they will continue.

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# 19.1
# HISTORY

*Rolf Torstendahl*

## AN EVOLVING GLOBAL INTELLECTUAL STRUCTURE

### History writing

Few people would deny that the discipline of history is less international in its internal structure than physics or even sociology. It is bound to languages, cultures and the past itself. In some respects it is more akin to legal studies than to natural science.

This does not imply, however, that history is necessarily less 'objective' than other scholarly activities. The fact that we have to know the language and the customs of the actors of the past to understand their thoughts and acts does not imply that the historian has to view their activities subjectively. And yet many historians have confused historical perspective with self-assertion, group identity formation and limited outlook, and in doing so, they have fuelled animosity and anger.

From its very beginnings, the discipline of history has been a mixture of politics and scholarship and this is still the case in the twentieth century. Many historians have accepted that history cannot be impartial, but they have struggled to find rules to minimize the influences of subjectivity and partiality. Consequently, the 'objectivity question' has been a central theme in the philosophy of history and the study of historiography.

Within the academic community of social sciences and humanities in the twentieth century, history is no longer on the forefront. Influences from other disciplines, including many new academic disciplines, have infused history with new facets. The blending of economics, political science, sociology and anthropology has given birth to hybrids that have fertilized history.

The discipline of history has thus become less focused on politics. Its current forms have given rise to new perspectives on interpreting society and its changes. Such new approaches are not accepted by all, and in addition to their cultural and linguistic particularities, historians differ with respect to their fundamental theory of history, which pre-dates the twentieth century.

### National perspectives before and after the First World War

The legacy of the nineteenth century persisted beyond the First World War. In Europe, this heritage was reflected in different ways. To begin with, history was one of the first disciplines in which professional researchers developed a clear code among themselves. Hofstadter writes: 'Up to about 1890, when Henry Adams was finishing his history, the major historians of the United States were still working in the tradition of the great amateurs. They were not formally trained to write history'.[1] In this respect, the professionnalization of historians was at least one generation ahead in many European countries. In France, early standards were set for the study of documents. In the nineteenth century Ranke, Waitz and Droysen had formed a German standard for the training of scholars within the discipline. A 'historical method' was developed, and historians could agree on historical 'facts' established according to these methodological rules. In Japan and China, long traditions existed in the scholarly writing of history. Yet, around the turn of the century, scholars in these countries consciously and explicitly merged domestic traditions with the most advanced European standards. Academic communities in many countries around the world followed suit. History as an academic discipline has been firmly professionalized since around the turn of the nineteenth century. History has, however, continued to be regarded as a subject of cultural entertainment that can be taken up by any interested person. Thus two partly overlapping traditions of history writing have developed.

Another legacy of the nineteenth century is the thematic content of history. History was regarded as primarily dealing with the state and its conflicts. Consequently, nationalism or a milder variety of patriotism was a main ingredient in the principal interpretations of history. Political history might vary, but the theme was traditional in most parts of the world.

Sato underlined another change in scholarly history of China and Japan. Historians were no longer the official spokespeople regarding imperial service. The European Enlightenment sparked a change of perspective that

continued to win ground in the new century; the learned were considered scholars with responsibility to the profession and the public only.

The European historical heritage of the nineteenth century was strongly national. It was most common to limit academic interest to the political history of one state only, and very often this national limitation led to a nationalist interpretation of relations with other countries. Late-nineteenth century radicalism and naturalism had counterparts in the writing of history, but these were undercurrents. The main paradigm was strictly national, only slightly more so in Germany (Sybel, Treitschke) and France (Lavisse) than in Britain or the smaller states of northern and central Europe.

The heirs to this ideological and scholarly stance reacted differently. Some developed the national theme further and approached totalitarianism or became fascists. Others took up the challenge of formulating an alternative and of viewing other aspects of history. From the interwar years, a national interpretation was no longer the only commonly accepted academic conception of the history of any European country. Social, economic and cultural factors competed with national ideas for prominence in explanations of historians.

Historians helped politicians define a national heritage. Nelson's Column in Trafalgar Square, the Siegessäule in Berlin and numerous other monuments glorified historic national achievements. After the First World War, all belligerent countries honoured their soldiers and commemorated their national past. It was most common among historians in Europe to write about these recent events or to glorify earlier national wars, as illustrated by the revival of the myth of King Karl XII in Sweden.[2] In the beginning of the century and in the interwar years, national history in Europe was dominated by an aggressive form of competition between countries, closely related to the fascism that developed in the same period. Although this is an important aspect of European historical writing, it is necessary to stress the elaboration of the national and political theme that also occurred at this time. Friedrich Meinecke, with his significant evaluations of German politics, the national state and state politics and power in history, was noteworthy but hardly alone.

The stress on the nationalistic aspects of history could also appear in other ways. In Germany, the opposition against the Versailles Peace Treaty stimulated local research combining history and anthropology in order to show the cultural heritage of the borderline provinces. This *völkische* research became a breeding ground for Nazi ideology.

Historians in the United States in the early twentieth century were bearers of a different cultural heritage than that of their European counterparts. The most renowned of the new historians reacted against the conservative state-centred approach of the previous generation. These so-called 'progressive' historians were led by Frederick Jackson Turner and Charles A. Beard. Turner, with his 'frontier thesis', which attempted to explain the American mind, and Beard, with his economic interpretation of the constitution combined with an isolationist stand, and other historians of their generation viewed history in the light of social science. They started out from assumptions of 'evidencing history' and contemporary tendencies of the social sciences in the interwar years and then supported these views. The paradigm was realistic. In this respect, American historians

were different from most Europeans, who tended to linger in epistemological idealism and were less inclined to regard history as a social science. The 'objectivity question' therefore had a different ring in the United States than in Europe.

National study of African history, in the European sense of the term, did not exist in the colonial period in the sub-Saharan regions. The colonizers attempted to record their own activities and accomplishments, but written history by domestic authors with a national perspective was lacking. To a certain extent, national traditions were transmitted with insufficient communication between colonizers and the colonized. Some recollections of slave experiences have been recorded, and other oral traditions have been saved, but these are limited primarily to the conditions of administrators and missionaries.

In the interwar years, most Latin American historians were trained in a positivistic tradition with the modernization of each country as the primary object of research. When Europeans and North Americans started to take an interest in the history of Latin America more extensively in the period after the Second World War, one major problem emerged: Why had Latin America developed so comparatively slowly in the period after the arrival of the Europeans? Underdevelopment and the theory of dependency, with André Gunder Franck as its most important advocate, underlay all explanations of the region's economic fate for a long period. However, not all history of Latin American countries has been tied to the theory of underdevelopment. The influence of the French *Annales* group and its distinctive approaches to history has been great in many countries of Latin America, particularly in Brazil. Already in the 1930s, Lucien Febvre and Marc Bloch established a link between Brazil and France. After the Second World War, the *Annales* devoted special issues to Brazilian history, and Frédéric Mauro, a disciple of Fernand Braudel, became professor of history in Sao Paolo, while other French historians working in Brazil helped to establish close historical connections between Brazilian and French culture.

Regionalism and economic perspectives on the history of Latin America easily blended with the influences from the *Annales* group and related French researchers. The Europeans working on Latin American history developed a great anthropological interest in the indigenous peoples and their history.

In contrast to most countries under the control of European colonial powers until the end of the Second World War, India had developed a flourishing group of domestic historical scholars. During the colonial period, many historians, like Jadunath Sarkar and Govind S. Sardesai, researched periods preceding the establishment of British power in India. Other historians, including Dadabhai Naroji and Romesh Chandra Dutt, held the British directly responsible for India's poverty and its lack of development. Thus the idea of a national history of India was voiced even before independence.

According to Ying-Shi Yü, the concept of national history was introduced to Chinese historiography in the early years of the twentieth century. Until that time, China was considered to be 'All-under-Heaven', which, according to Yü, best illustrates the Sinocentric world order.[3] The history of China, which was thought to encompass all that was worth knowing in the world, was not conceived as a whole: it was divided into dynasties and centred on the emperor.

Through the activities of Chang Ping-lin and Liang Ch'i-ch'ao, China developed a historical school emphasizing *national essence*, a term borrowed from Japan. According to this concept, China had a spirit of its own, which could not be copied but which should be preserved. The national message acquired a moral tinge just as this group embarked upon the task of writing the nation's history. Western influence was transmitted by Japanese scholars who had already absorbed the national theme in their works.

From the beginning of the 1920s, the National Past movement appeared as a new intellectual force in China. In 1922, Ku Chieh-kang began a critical study of Chinese historical traditions and their evolution as recorded in the classical novels. He demonstrated how the legends grew and new episodes were invented to enhance the prestige of the past emperors. Fu Ssu-nien followed this critical line still further by introducing a new element: he suggested that sources had to be penetrated in order to lay bare data that then could be used by the historian to present a nation's past. He and the other members of the National Past group wanted to make history scientific and objective. Although they managed to discredit traditional conceptions, they failed to propose a viable alternative.

Even though the National Past group was based on a conception of a national Chinese culture, its writings were mainly anti-nationalistic. When China was attacked by Japan in 1937, nationalistic feelings surfaced more openly in Chinese society and even Fu contributed with his historical study. Others went further: for example, Ch'ien Mu wrote a narrative outline of Chinese history, which assured the reader of China's illustrious past and future possibilities. Both Marxists and 'dataists' resented it even though its nationalism was more cultural than militaristic.

Around the turn of the nineteenth century, Japanese historians often referred to European historiography. In the context of Japan's rising military power, the national heritage with the unbroken dynastic line of the imperial family was raised to a position of prominence. The nationalistic view of history known as Kokoku-shikan, depicting Japan as the country of Tenno (the imperial god-relation), was adopted by many historians in the first four decades of the twentieth century. Contrasting views persisted however as illustrated by the fact that Marxist historians were numerous and often voiced their views during the interwar years.

After the Second World War, Marxism maintained a strong following among Japanese historians, but it was adapted to the local context. Economic history, and more specifically business history, remains firmly implanted in Japan, and social history of the variety associated with the *Annales* has become widely recognized and practiced.

**World congresses**

The world congresses of history began with the twentieth century. Indeed, the first so-called world congress of history – officially an 'international congress' – took place in Paris in 1900. Among the non-European countries attending the congress were Algeria, Argentina, Australia, Brazil, Canada, Chile, Cuba, Dominican Republic, Iran, Libya, Mexico, South Africa, Turkey and Venezuela. Each country, except Cuba and Mexico, sent one participant. Considering that only 100 to 200 of the 864 pre-registered participants actually attended the congresses, it can be

assumed that some of the few historians from far-away countries did not attend.

Erdmann's thorough analysis of all the congresses up to the Second World War provides a very clear picture of the dominant position of the Europeans, and particularly the Germans and French followed by the English, Italians, Belgians, and Poles. The only other country to play a leading role at those early congresses was the United States.

The congresses in Paris, Rome, Berlin and London, which took place between 1900 and 1913, were more European in scope than international. When the congress meetings were resumed after the First World War in Brussels in 1923, only a handful of non-European countries registered: Canada, Egypt, Japan, Lebanon, Rhodesia, South Africa, Turkey and the United States. Approximately half of the registered participants actually attended the congress.

Hopes rose when a standing committee was formed in 1926. The Comité International des Sciences Historiques (CISH) was to bear the responsibility for organizing the congresses. An American, Waldo Leland, played a prominent role in the formation of the organization, but the CISH was barely more international than the preceding congresses. Argentina, Brazil, Chile and Japan were the only non-European countries beside the United States invited to participate in CISH from its inception. Beginning in the 1930s, Soviet representatives were incorporated in the international committee and the smaller European countries were better represented. Although the circle had been widened, it remained restricted to a small number of countries.

The first effort actively to involve the major Asian nations in the work of the CISH was made by the committee's president, Harold Temperley. Travelling to Japan, China and India in 1937, Temperley managed to arouse interest for an active membership in the CISH from these countries and requested the organization's Bureau to quickly initiate new forms of cooperation. At the following congress in 1938, Japan was not represented at all; China and India sent one and five representatives, respectively. As this congress was dominated by the political and ideological tensions within Europe, Temperley's initiative had little lasting effect.

In fact, CISH has never become a truly international body. When, for the first time in 1995, a serious proposal was made to hold the next congress outside the Europe-North America axis, a European location was ultimately selected. The Bureau elected in Montreal in 1995 consists of representatives from six European countries, the United States, Canada, India and Japan, and a Hungarian president who resides in the United States. China and South-East Asia, Africa and South America were not represented. Problems formulated in Europe or the United States are regarded as the main problems of historical scholarship, and generally relate to questions on a specific history or the theory of history. Some efforts have been made to integrate scholars from Asia, Latin America and Africa in the discussions of the congresses, especially from 1965 onwards. Individual scholars from these regions of the world have been able to put forward their interpretations of important themes. Often language has been an obstacle since the languages of oral presentations are traditionally English, French or one or two other European languages. Non-European languages

have never been accepted as the basis for communication in this international community.

## Post-Second World War developments

The national perspective on history has acquired new relevance in recent years. History is part of a new formation of national identities in Eastern Europe, Africa and extensive regions of Asia. The Second World War and its consequences, and to an even larger extent, the decolonization process have contributed to changes in the world's perception of history. National history has become not only strengthened but also transformed through this process.

The political situation in much of the world was transformed after the Second World War. In China, communist historians made efforts to combine Marx's views on Asiatic societies with Chinese history as early as the 1930s. Much attention was devoted to the question of the meaning of the 'Asiatic mode of production'. The weakness of capitalism in relation to the feudal system in China also became a point of discussion among historians. After the Chinese Revolution, many wondered whether the Revolution could be regarded as a socialist revolution in Marxist terms. Chinese historians in the period after 1949 favoured an approach combining an evaluation of the relatively progressive effects of events and social data with a 'class viewpoint' assessment of the Revolution. However, the Chinese showed a continuing interest in Western historiography and, except during the Cultural Revolution, the links with the development of the discipline in other countries was preserved.

In India, independence meant a new start in many areas, including the discipline of history. Ancient and medieval Indian history have made great advances, and D. D. Kosambi and Romila Thapar among others have shed new light on the agrarian structures resulting from relations between religion, caste and family in these periods. Economic and social history have developed rapidly and become very successful in independent India with analyses of social consequences of major economic enterprises emerging as a major sub-field of inquiry. Politically, however, the main interest has focused on the struggle for independence. Bipan Chandra and others have shown how the anti-imperialist struggle gave rise to a new national identity in a country deeply divided by ethnic, linguistic and religious problems.

As a nation, Nigeria was a colonial creation, but Britain was guided by ethnological, geographical and historical factors, contends Ade Ajayi. After liberation from the British, national Nigerian historians sought to evaluate the British rule. Marxist historians criticized the basis of national historiography and urged reviewing Nigerian history in the light of development. Ajayi asserts that the criticism did not change the opinions of nationalist historians, who unanimously rejected the theory of underdevelopment as being more applicable to Latin America and its long colonial history, than to Nigeria, where colonialism lasted no more than 100 years. Nationalist historiography stressed the continuity with the pre-colonial past.

In Zaire, European scholars and historians trained in Europe played an important role in the early stages. Only gradually were indigenous scholars trained to conduct studies from a national perspective. A restructuring of higher education in the country took place at the national University of Zaire in 1971, endowing Zairean history and historians with established positions. After 1970, national research mainly focused on themes related to the colonial period and earlier. Research carried out on Zaire's diverse communities transcends state borders. Particular emphasis has been placed on ethnographic history and the use of technology.

In the German Democratic Republic as in the Federal Republic of Germany, historians endeavoured to deal with their traumatic past. Although there were two German states, historians of both countries studied the same national history before 1945. Given its close relation to the Soviet Union, the GDR demanded a Marxist outlook from its scholars, and in many respects historians of the GDR were more doctrinaire than those in other countries of the so-called Eastern Bloc. It seems, however, that this historical orthodoxy diminished after 1970.

Many important contributions to German and European history were made by East German historians adopting the perspective of historical materialism. Beginning in the 1970s, both older and younger historians took a freer approach to material interpretation – the biographies of Bismarck and Frederick the Great by Ernst Engelberg and Ingrid Mittenzwei, respectively, may serve as examples – but they used it to maintain a safe distance from the heritage of German historicism and research in West Germany. The critics of East German history in the West were harsh, and after the fall of the Berlin Wall in 1989, they were joined by some historians from the former GDR.

In communist Hungary, historical materialism was not as rigid as in the GDR, and Hungarian historians were not as preoccupied as their German colleagues with their national past. These two circumstances proved important for the relatively flourishing state of Hungarian historical scholarship after 1945. Led by György Ranki and Ivan Berend, Hungarian historians have played an important role in reconceiving European and international history by combining economic and cultural data.

The history of the Russian Revolution has inspired many thorough studies of the actors and events in that period of turmoil. Of course, political scientists were extremely interested in the Soviet Union, but historians, both Russian and Western, have also made important contributions to the study of this overly centralized system. Yet, explaining a structure that is expected to last is different from explaining structural change. Since *perestroika* the main problem has been to determine the causes of political and social change, and a so-called *civilization approach* has been favoured by Russian historians, who combine class analysis and economic organization with cultural phenomena. Again, some explanations tend to focus on prominent actors, while others select theoretical models of economics.

## The opening up of national boundaries

Naturally, most historians choose to work on subjects related to their own nations. This also holds true for Jewish historians dealing with Jewish history, even though Max Beloff's observation on the difficulties of defining the object of Jewish history is pertinent. Researchers concentrating on national history normally know the language well and can rely on a great deal of tacit knowledge. In addition, national

researchers can access source material more easily than their foreign colleagues. One can therefore argue that it is logical that historians give priority to the history they regard as 'theirs'. However, the mainly post-Second World War phenomenon of researchers studying their national history has been seriously challenged in recent years.

One of the positive effects of the international congresses of history is the establishment of a large number of commissions and associations for specific fields of research. Many of these commissions function independently of the congresses by organizing their own meetings and conferences. Some commissions have existed for a long time. Europeans and North Americans still play a major role in these commissions, and in many cases their participation has increased, while the involvement of historians from other parts of the world remains low.

Today's scholars are much more mobile than ever before. However, this does not mean that the labour market of historians has become truly international, for most positions are reserved for those scholars culturally linked to the country despite the fact that recruitment is officially open to all. Although it is true that the academic labour market was more closed in the past, professional scholars of history are much more confined to a particular cultural milieu than their counterparts in all science disciplines and in many social sciences and the arts.

Despite such restrictions, a change has taken place. In Europe and North America, it is common to find academic historians who were not born in the country where they work. In order to obtain their positions, they must adapt to the rules of the institution. Most have settled permanently in the country and are quite familiar with its language. Some come from countries within the Euro-American circle. Those from the Third World are more likely to work in the Unites States than in Europe. Europeans and Americans working in Third World countries often have temporary assignments from research or relief foundations. Even if they endeavour to establish contacts with the researchers in the country where they work, they are less likely to succeed than those with tenured positions in universities or academies.

### International research and the question of perspective

Scholars from Europe and the United States have shown much interest in investigating the history of former colonies, sometimes spreading this interest to other countries. At present, important centres for primary research work on the history of world cultures have been created in the United States, Russia, France, Germany and Japan. Former colonial powers are particularly committed to studying the history of their former colonies, as attested by the important handbook series on several countries published by Oxford and Cambridge universities. This field of study, initiated during the colonial period, has been carried on and even extended to other countries.

Several historians from Europe worked on colonial history during the colonial period. They did not restrict their research to themes related to the period of European domination, and some continued to be extremely respected in academic circles. The most devoted have undertaken widely esteemed research and educational work after the dissolution of colonial power, notably the US-based Belgian specialist Jan Vansina, and several other Belgian, French (e.g. Catherine Coqery-Vidrovich), Portuguese, American and British researchers who have studied in the former Congo and Angola. In the former French colonies of West Africa, French researchers have done important work. Dutch historians have played a leading role in Indonesia, and many American and British researchers have contributed to the historical knowledge of India.

## THE DISCIPLINE OF HISTORY

### History – the continuation of a great tradition

The tradition of writing and studying history predates the development of higher education. Thus history, unlike many other disciplines, was not the fruit of opposition against other predominant approaches to knowledge but has rather engendered many disciplines. Over the last century, history like most other disciplines has undergone an enormous degree of specialization. Nevertheless, the field has proven remarkably cohesive as evidenced by the fact that most specialists prefer to be regarded as historians contributing to an overall historical discipline rather than belonging to an independent discipline.

### Specialization and anti-specialization in historical perspective

The first great wave of specialization within the discipline of history occurred at the turn of the twentieth century when bitter fights erupted over economic history and cultural history. It should be noted that when the world congresses of history were first created in 1898, they focused on diplomatic history. The scope was widened in 1900 in keeping with the belief that the 'historical method' rather than a topic should decide the breadth of history, as expressed by Boissier, the president of the 1900 congress.

A new wave of specialization appeared after the Second World War. Scholars showed a great interest in themes whose temporary nature ensured cohesion within the field. Many themes died out, while others managed to survive, albeit less vigourously. *Economic history* underwent great diversification in the twentieth century. In 1960, an independent international organization devoted specifically to economic history was established. Economic history greatly overlaps with social history. One sub-branch of this field is the history of national economies, which is closely connected with economic theory. Its relevance is determined by theoretical perspective. Such studies take up questions regarding the history of industry and business and the conditions required for their change, including the role of technology. Most of these studies concern the situation in the United States, though they have sometimes been applied to other parts of the world.

Industrial organization and the role of management have been studied by a group of scholars, inspired primarily by the American Alfred D. Chandler. Europeans from different countries have joined this field of research and contributed new perspectives. This sub-branch of economic history is closely related to the history of individual firms, which is in great demand among industrial and business concerns. Other fields of research in economic history include nutrition and food in history, agrarian development, the

economic conditions of caravan trade and high-sea transport. Thus, economic history has developed in different directions establishing itself as a discipline in its own right in many countries and becoming almost as multi-faceted as history itself.

Very rapidly, social history also became multi-faceted and almost all-embracing. At an early stage, it acquired political as well as sociological orientations. History of social policy received much attention in the early twentieth century, when different social policy measures were first compared systematically. This starting point led to thorough investigations of the welfare state and, in recent decades, to an analysis of the discipline of the well-ordered absolutist state and the social policy of earlier centuries. Crime, violence and the judicial process have also come to the foreground.

Historical materialism, as described by Marx and Engels, has provided valuable insights to many Western and Eastern historians of this century towards the understanding of history. This field has long dominated economic and social history in many countries. Although several schools of historical materialism have emerged, there is a dividing line between structural, and cultural and intellectual interpretations. Georg Lukacs and E. P. Thompson are the main proponents of the latter approach, while the structural interpretation has been advocated by theoreticians such as Althusser and his followers.

Class analysis, often derived from historical materialism, has been a vital branch of social history throughout the twentieth century. This was officially adopted by the Soviet Union in the wake of the Russian Revolution. After the domination of a dogmatic leftist interpretation under the leadership of Pokrovsky during the late 1920s, history was forced to submit to the will of Stalin in the early 1930s. Although Stalin's terror was devastating for many scholarly works on Russian history and other disciplines, it did not seem to affect historical studies of the West, which were not forced to include Stalin's own views. This enabled some researchers to work rather freely from the basis of historical materialism. After the Second World War, a formal Marxist perspective became compulsory in the communist countries of Eastern Europe, China and North Korea. As a result, class analysis of society came to the fore as a main current of historical research.

In the West, several leftist historians had devoted many years of research on social history, and the Marxist revival of the late 1960s and 1970s increased the contributions in the field. Eric J. Hobsbawm, who undertook several substantial investigations of working-class movements in relation to social conditions and other wide-ranging studies, and E. P. Thompson, author of *Making of the English Working Class* (1963), represent different currents within the British tradition. The French Revolution, popular as a historic example among Russian Marxists, especially Trotskyites, provided inspiration for Marxist-orientated social historical analysis by Albert Mathiez, Albert Soboul and Georges Lefebvre. In Poland, Witold Kula's new analyses of the European agrarian economy in the sixteenth and seventeenth centuries prompted Western European historians to renew their investigations on this subject. Eugene Genovese and Elizabeth Fox Genovese, working in the United States, fought econometricians for a more Marxist-inspired perspective in their analysis of slavery.

Social mobility and migration have been widely investigated in the context of Europe and the United States, while the history of Chinese emigration, so pervasive in Asia and America, has been far less studied. The related topics of geographical and social mobility have often been treated together in the context of geographical and sociological theory. Political scientists have advanced the study of institutions and bureaucracy and the relationship between state and society. Thus the boundary between social and political history is once again blurred.

At the beginning of the twentieth century, a fierce discussion sparked by Karl Lamprecht's work on German history and his ideas on political history arose in Germany over the status of *cultural history*. In his writings, Lamprecht relegated political history to a secondary role, in favour of economic history and the history of law, ideas and arts, all of which he considered more fundamental. Lamprecht's ideas spread mainly in France and in parts of northern Europe.

The status and scope of cultural history was ambiguous. Its advocates wanted, on the one hand, to encompass all of history and, on the other hand, to emphasize those aspects of human life, such as customs, ideas, and art, that had been only marginally treated elsewhere. Such themes soon developed into specialities of their own. Intellectual history, as the history of thoughts and ideas, had long been explored by historians, but its more specific sub-categories involving links to ancient philosophy or to modern science flourished during the interwar years.

The relationship between scientific concepts and popular ideas became a main theme in history after the Second World War and prompted an interest in pseudo-science, as exemplified by Carlo Ginzburg's *The Cheese and the Worms*, or Emmanuel Le Roy Ladurie's paradigmatic *Montaillou*. Natalie Zemon Davies brought the genre into the field of life-values and identities with the story of Martin Guerre, and Robert Darnton, Jacques Le Goff and Aaron J. Gurevich have analysed other aspects of popular conceptualizations and their backgrounds. Peter Burke has made similar contributions in the realm of political culture. All these authors have worked within the genre commonly referred to as the 'history of mentalities'.

Another principal type of specialization deals with a specific period in the history of a country. Historians who concentrated on one king or one revolutionary sequence of events were following a paradigm that figured prominently in the first half of the century. Although this paradigm was called into question after the Second World War, it has neither disappeared nor been superseded. Few of these specialities were as successful as the study of the French Revolution, which led to the foundation of a specialized historical society with its own regularly published journal, *Annales historiques de la Révolution française*. Most other specialized periods of study only created informal networks of researchers, who were familiar with each other's works and sometimes met, but who were also competing for material and theories.

The theories of Marx and Weber can apply to all aspects of human life. Alternative comprehensive theories have been expounded, but they often only partially cover the wide gamut of human activity. Although economic theories have a different scope, they have most strongly impacted economic history in a restricted manner.

*Demography* contrasts with the other fields because it has been expanding in different directions and has attracted

many historians. What started out as a history of populations, migration and families, in general terms, has developed among other things into a specific family history. Such research was pioneered by Peter Laslett of Cambridge University, while more anthropological studies of past marriage patterns were inspired by the work of the Hungarian researcher J. Hajnal.

*Women's history* developed as an offshoot of family history, a field that attracted many women. Louise Tilly and Joan Scott, both from the United States, wrote a well-known overview of women in history. Feminists of the early 1980s proposed transforming the term *history* to 'herstory' and to ensure more visibility for women in history, thus leading to the creation of a new ideological system.

Another area of research that grew out of women's studies in the late 1980s was *gender theory*. An important branch of history in recent years, *gender history* encompasses a variety of approaches, which are all based on the shared assumption that along with biological sex, there exists a social construct of gender that provides a rule system for men and women in society. As a social rule system, it is subject to change, and comparisons of gender history have proved fruitful. One of the most influential specialists of gender history links it with postmodern linguistic relativism,[4] but this is not a generally accepted assumption among gender historians. In terms of the number of historians recruited, the field of gender history seems to be the fastest-growing branch of history over the last few years.

## Research centres and interdisciplinarity

While the nineteenth century saw the birth of the historical seminar characterized by the conscientious weighing of interpretation of sources and of their validity, the twentieth century witnessed the creation of advanced institutes of research with very broad or limited thematic scopes of interest. Institutional stability has increased. In most countries, actual departments of history were rare at the beginning of the last century. The institutional growth that occurred over the course of the twentieth century has created a congenial environment for scholars to test ideas informally and has ensured a future for new generations of historians. The principal drawback of institutional structures is a certain streamlining of academic research. In addition, the role of individualism in historical scholarship has been considerably diminished over the last century.

Several major research institutes have been particularly influential, especially in the period after the Second World War. Founded in 1963, La Maison des sciences de l'homme in Paris is an unusually broad research centre, and in this respect, it is unique among French institutes. The institution embraces almost all fields of social sciences, but is particularly renowned in the fields of sociology and history. Since its creation, it has hosted the *Annales* group, which is well suited to the Maison's interdisciplinary environment, given its commitment to break down the limits of history and uncover new fields for historical research.

Despite differences in structure and objectives, the Institute for Advanced Study in Princeton can be compared to the prestigious Parisian research institute. As has been the case in some other institutes of advanced study – the Wissenschaftskolleg in Berlin, The Netherlands Institute of Advanced Study in Wassenaar, the National Humanities

Center in North Carolina (USA), and the Swedish Collegium for Advanced Study in the Social Sciences – historians have been invited to the Institute for Advanced Study for a limited period to pursue their research. The same holds true for the Indian Institute of Advanced Study in Shimla.

In these special environments, historians participate in research discussions and joint projects with scholars of the social sciences and arts. Another approach is taken by the ZIF (Center for Interdisciplinary Research) in Bielefeld, Germany, where guest historians participate in thematically organized research groups.

At the institutes of the Russian Academy of Sciences (notably the institutes for Russian and world history in Moscow), historians collaborate with researchers from other disciplines, especially anthropology and archaeology. Other former communist countries have founded similar institutes, which are often specifically devoted to history but maintain professional contacts with other disciplines.

The growth of the interdisciplinary research institutes has taken place largely since the Second World War, though preliminary steps were taken in the interwar years. Through these institutes and many more loosely organized university networks, historians have become part of a growing worldwide interdisciplinary culture. In this regard, the interrelation of findings from different disciplines has become an urgent problem.

## History as a basis for the formation of national identities

In the early decades of the twentieth century, national histories with a nationalist slant incited lively debate. New fuel for the emotional fire was provided by the events of the First World War, but a new scepticism in regard to nationalism in scholarly works also emerged. Many highly praised works on national history of the late nineteenth century could not have been written after 1918. Another type of history, written by prominent scholars in the service of state ideologies, eventually appeared. It is well known that National Socialism in Germany placed demands on scholars to produce such works, but Germany was not the only example. This genre has survived to the present day, taking the form, beginning in the 1990s, of ideologically biased history, which uses a theory of history (postmodernism or relativism) to proclaim utopian interpretations of history for the sake of an ideology.

Historical scholars, when not pressured to take up the state's cause, have become more and more cautious in the use of nationally loaded symbolism. Many have used their talents to unveil the dangers and the emptiness of national symbols. German debate over the Holocaust (*Historikerstreit*), which broke out in 1986, demonstrates that not all scholars are pursuing the same goals. Some wanted to restore a national interpretation of history for the sake of inspiring the people with national pride, while others hoped 'enlightenment' would replace such national pride. 'Making sense of history' (*Sinnstiftung*) and 'recreation of identity' (*Identitätsstiftung*) meant for the former group of scholars to give Germans a sense of pride in a heritage from the past in spite of 'Kaiserism' and Nazism. For their opponents, the identity-formation associated with these terms was a dangerous exercise motivated by political

considerations rather than by scholarship. A great corpus of literature on this debate was published at the end of the 1980s.

To accept a historical past of sharp contradictions in values and ideals or to discriminate between them and take a clear position is a choice which has become more and more urgent for historians of all nationalities. Few countries enjoyed a pacific existence in the twentieth century. For most peoples, the past hundred years have been marked by tremendous violence and turmoil, and their own nation has not always sided with the forces of good, the harassed and the victims. A special case is Holocaust research and the European history of the Jews. Often atrocities constitute a part of the past of one's country. To avoid both the Scylla of racism and the Charybdis of nationalism and to give proper weight to biological heritage and identification are tests that have to be passed by historians in many countries. Establishing national identity through history is not an easy achievement.

### A theory of history as a philosophical identity-formation

Like historians of past centuries, few twentieth-century historians have actively participated in the ongoing debate on the philosophy of history. Some earlier historians did write on philosophical problems of history, but they were exceptional cases. In the Soviet Union, the theory of history played an important role, and differences in the interpretation of historical materialism were growing in the 1960s and 1980s. In recent decades, discussions on these topics were reported in the only specialized journal in the field, *History and Theory* (inaugurated in 1960). It is striking that most of the contributors are philosophers or professional historical theorists.

However, in recent world congresses and in the general debate, the theory of history attracts great interest from general historians. Perhaps most historians have opinions on the theory of history, the past per se and the nature of historical understanding. It seems that the 'linguistic turn' of historical theory and 'postmodernism' have contributed to the widespread appeal.

However, this does not necessarily mean that historians have become more unified in their theoretical outlook. In spite of differences of viewpoints and fundamental beliefs, the theory of history seems to serve increasingly as a means of identification for historians of different specialties. The narrower specialities become, the greater the need for a more general basis of identity, even though this does not lead to a more unified community of historians.

### History of historiography

In contrast to the theory of history, the history of historiography has generated widespread interest among historians. Many have written at least one contribution on the subject, but the degree of specialization is limited. Few of those working on problems of the history of historiography devote themselves exclusively or mainly to such themes. Historians inevitably feel that they are either part of a research tradition or revolting against one. The history of historiography in this way serves to provide a common

heritage for historians. This heritage has grown increasingly international, as the historiography of the East has become known in the West and as the ideals of research professionalism have spread from Europe to the rest of the world.

### Growing unity and increasing diversity

In the face of adverse odds, history as an academic discipline and field of research has become increasingly similar over the world. Strong forces have worked against the formation of a single academic community. History can be created only through an intimate knowledge of the cultural and linguistic rules which have determined the material and constitute its foundations. Furthermore, history like many other academic disciplines has become increasingly specialized in the twentieth century. Both of the above conditions could theoretically prevent or diminish understanding between historians.

The counterforces have also been strong. An international assembly of historians has been successfully orchestrating world congresses, which have gradually become more international. Earlier specialization in national histories found competition from thematic specialities during the twentieth century, which means that there now exists a profusion of networks among historians from different countries with a common interest in a particular field of historical study. Moreover, historians of the twentieth century have become more used to seeking assistance from other disciplines in the form of social theories or methods of research. Interdisciplinary work by means of borderline research or organized teamwork has further linked historians to a wider academic community. 'Universal' history, attempting to embrace development in all its facets, has had rather few advocates and practitioners. The ambition to write an all-embracing history (*histoire globale*) has led to the rise of new aspects and the continuous inclusion of new fields into the realm of history, rather than to new overall perspectives.

The theory of history and the history of historiography are now specialities in their own right. For the general historian, however, they have another and more significant importance: they are tools for the self-understanding of historians as members of a scholarly community. The more historians from different countries meet, the more they need something beyond a speciality to clarify their identity as historians in order to prevent the community from splintering into a number of specialities. In the last half-century, historians have recognized this need, and they have been lucky to have the two possibilities mentioned to canalize their growing uncertainty of history as a whole and of the 'historical community'. For this reason, these scholars can still consider themselves historians in spite of the ongoing specialization.

Most striking is the rapid internationalization of these developments. What was only a partial and slowly developing community among historical researchers in the first half of the twentieth century has rapidly grown in scope and intensity. Fundamental methodologies and rule systems are acknowledged all over the academic world of historians, and although failures to live up to the rules do occur, they are not limited to certain countries. Paradoxically, postmodernist relativism facilitated the acceptance of

common standards, at a time when the ideal of attaining an objective and common true history has been abandoned (if it ever existed). The global academic community of historians, which was not desired by many historians only a couple of generations ago, is now well on its way.

## NOTES

1.   R. Hofstadter, *The Progressive Historians: Turner, Beard, Parrington*, New York, 1969.
2.   K.-G. Hildebrand, 'Till Karl XII-uppfattningens Historia', in *Historisk Tidskrift*, 1955, pp. 1–46.
3.   Y.-S. Yü, 'Changing Conceptions of National History in Twentieth-Century China', in: E. Lonnroth et al., *Conceptions of National History*, Berlin, 1994, pp. 155–74.
4.   J. W. Scott, *Gender and the Politics of History*, New York, 1988.

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# 19.2
## ANTHROPOLOGY AND ETHNOLOGY

### *Heidrun Friese*

Bronislaw Malinowski sailed towards the objects of his future study, escaping the European battlegrounds in the expectation of being received by the administrators of colonial power in New Guinea (Plate 96). His mind was filled with Conrad's novels and morphine and 'impure thoughts' and his luggage contained the research guidelines of the 'Notes and Queries'. His view of the 'exotic' world he would soon encounter was interwoven with mythological and culture-critical images of a closed unitary community and resembled an estranged self-image of his own 'Western society'. Nevertheless, the brave Malinowski was one of the first 'heroes' of a new anthropology[1] who said farewell to the universalistic and evolutionist classification systems of the 'armchair anthropologists' of the nineteenth century (e.g. James Frazer and Edward Burnett Tylor) and – together with Reginald Radcliffe-Brown, Margaret Mead and Marcel Griaule – established *participant observation* in field research as a professional research methodology. Up to the present day, extended field research is seen as a requirement of anthropological analysis; it thus provided a common, scientifically acknowledged method and convention for what otherwise remained a diverse variety of anthropological perspectives. It was participant observation that allowed the discipline to distinguish itself in terms of methodology from Western sociology, itself an emerging discipline of that period.

In terms of substantive orientation, anthropological discourse developed specific ways of setting boundaries of exclusion and identity in the making of its objects by means of segregating the 'other' from a 'we' that had to be constructed as well. The fact that anthropology and sociology developed as separate disciplines for the study of contemporary societies presupposed a strong distinction between 'us' and the 'others'. The mode of constructing the other therefore constitutes a persistent implicit problematic of anthropology. It has become central and explicit in more recent debates, when anthropology has focused on the societies from which it originated and has played a key role in epistemological debates common to all the human and social sciences. These recent developments have also entailed a kind of dissolution of the boundary between anthropology and sociology, which was never very stable and clear-cut in theoretical terms. In this chapter, we will thus refer to a number of authors who are similarly claimed by the sociological tradition (see sub-chapter 19.6 on sociology). The criticism directed against the definition of the object of anthropological research that relied on the Eurocentric construction of a 'modern' self versus a 'primitive-traditional' other has also led to the establishment of fields of study labelled 'sociology/comparative sociology' in societies which used to be regarded as 'other' from a Western viewpoint.[2]

In 1871, E. B. Tylor defined culture as 'that complex whole which includes knowledge, belief, arts, morals, custom, and other capabilities and habits acquired by man as a member of society'. Thus, the perspectives of British social anthropology, which placed special emphasis on 'society', and of American cultural anthropology, which underlined the historical-cultural aspects of human social life, appear complementary rather than contradictory.[3] Differentiation and pluralization of the discipline, on the one hand, and transnational diffusion of theoretical concepts and research areas, on the other hand, as well as the opening towards other disciplines (sociology, history, psychology, literary theory, theory and history of art) have further diminished the importance of these conceptual boundaries during the twentieth century. The persistence of terminological differences is nowadays due to the inertia of academic structures (which tend to eternalize traditional terminologies) rather than to clear-cut theoretical boundaries.

Instead of reiterating traditional distinctions, we shall try to identify the points of convergence of the various approaches, their founding presuppositions, matrices of concepts and key topics, and we shall try to demonstrate how they attempted to answer some of the key questions of cultural and social thought such as the relation between the individual and the social space, and the temporality of human social life and its representation.

### INTEGRATION, NORM AND FUNCTION

The methodology of field research standardized since Malinowski, which no longer relies on reports by travellers, missionaries or colonial officers but on the anthropologist's own experience of social life, was not merely to guarantee

the authoritative status of the qualified scholar and her or his initiation into the academic corporation and its reputation. The thus-instituted dialectics of researching subject and researched object, of privileged 'view from inside' and 'distance' to the object, which regarded the direct and contemporaneous experience of the 'other' as a precondition for valid analysis and interpretation, was also meant to provide an objective and theoretically integrated overall picture of the examined society and allow for generalizations, i.e. the identification of regularities in social life, of its institutions, values and norms, rules and laws.

However, the new genre of ethnography, with its naturalistic-realistic mode of writing, was not only characterized by its emphasis on the authority of its own observations in the textual representation of the 'other'. Being synchronically locked into the ethnographic present, the observed societies were constructed as static and ahistoric ensembles of characteristic forms of behaviour and collective representations, which formed a coherent and homogenous whole (Emile Durkheim, Marcel Mauss, Lucien Lévy-Bruhl). Key research subjects in the traditions of both social and cultural anthropology accordingly involved the *functional integration* of a society governed by the analytical subdivision of the societal whole into harmoniously related sociocultural realms – such as social organization, economy, religion and law. The North American 'culture and personality' studies, which relied on the common assumption of 'functional interdependencies and value orientations that bring structure to a culture and regulate its systemic processes'[4] regarded the cultural integration of the individuals as being mediated by 'basic emotional stylization', 'cultural patterns' or 'psychology types' (Margaret Mead, Ruth Benedict), by 'dominant culture interests' (Ralph Linton) or 'values and world view' (Clyde Kluckhohn, Robert Redfield). The European perspective, in contrast, saw stability being achieved by the integration of partial societal realms and institutions (Emile Durkheim) and accordingly emphasized the study of social relations and social structures (Reginald Radcliffe-Brown, Edward Evans-Pritchard). In both cases, however, the dominant theoretical paradigms were oriented towards the categories of *integration, norm and function* despite all differences between the concepts and intellectual genealogies of the schools.

This common theoretical programme was based on two basic underlying assumptions. First, the reality of society was conceived as lying somehow behind, under, or outside of the notions and 'self-explanations' given by a group or society. Its essence could therefore only be grasped by means of theoretical construction (Karl Marx, Emile Durkheim, Talcott Parsons). Second, society could be seen as a somehow stable and harmonious whole, which gained an internal dynamic and social change predominantly through exogenous factors, such as colonial subjugation. Although, in exceptional cases, as Max Gluckman already pointed out, societies do not remain in a harmonious state of equilibrium, but establish themselves through conflict and contradiction. The procedure of analysis and cross-cultural comparison, therefore, was the construction of segregated, homogeneous and well-integrated entities. It was based on the presuppositions of an epistemological break between 'subject' and 'object' and of congruence between historical distance and cultural difference.

## DIVISION, OPPOSITION AND MEDIATION

These assumptions and analytical procedures of the structural-functional school and its mighty discourses – which also predominated in the academic institutions of the countries subjugated by colonialism such as the Rhodes-Livingston Institute (northern Rhodesia), the East African Institute of Social Research (Uganda) and the West African Institute of Social and Economic Research (Nigeria[5]) – found their continuations in the episteme of French structuralism, which linked the Saussurean linguistic heritage to anthropology (see Claude Lévi-Strauss' four-volume textual interpretation of the myths of both Americas, *Mythologiques*). The variety of social and cultural phenomena 'could be rendered intelligible by demonstrating the shared relationships of those phenomena to a few simple underlying principles' and by recourse to the universally valid binary oppositions of the human mind. Cultures were predominantly understood as systems of classification, and 'one of the most secondary operations of culture in relation to its own taxonomies is precisely to mediate or reconcile the oppositions, which are the bases of those taxonomies in the first place'.[6] Mythic structures paralleled social structures according to Lévi-Strauss, but not because myth mirrors society, but because myth and society share the commonality of an underlying structure.

This perspective structured numerous works of social anthropology (Raymond Firth, Edmund Leach, Rodney Needham), which did not necessarily share Lévi-Strauss' universalism, but analysed in many detailed studies the processes of symbolic mediation of such fundamental divisions and oppositions as nature vs. culture, female vs. male, pure vs. impure, structure vs. anti-structure (Mary Douglas, Victor Turner). The mainstream approaches of cultural anthropology, in contrast, were less influenced by the structuralist paradigms, since they were more interested in ethos and values and in the relation between form and contents of cultural symbolizations.[7]

Despite the emphasis on 'scientificity' and objectivity, elements of cultural criticism were either explicitly or implicitly inherent in those anthropological perspectives. Lévi-Strauss' critique of the Hegelian postulate of a universally valid course of history and of the necessity of the development towards a 'modern state' as well as his distinction between 'hot' and 'cold' societies, for instance, are well known in this respect. However, in the course of the anti-colonial liberation movements and the Western social movements of the 1960s, the colonialist involvements of the discipline were made a topic of anthropological debate.[8] On the one hand, this criticism led to anthropology's turning to the 'others' in one's own societies, peripheral communities and marginalized groups in 'Western societies'.[9] On the other hand, critical inquiry in the form of questioning the political-ethical implications of field research[10] and the position of anthropology in global power configurations, as well as the critique of one's one society, found its theoretical framework – not least under the influence of Louis Althusser – in structural Marxism.

In contrast to the materialist approaches of *cultural ecology*, which analysed the adaptation of cultures to their natural-material environment (Marvin Harris, Roy A. Rappaport, Elman R. Service), Marxist perspectives

emphasized the analysis of social relations in terms of structure and sought hierarchies of causes determining the functioning and the development of societies. Thus, the hierarchies of the anthropological viewpoint were displaced. Privileged explanatory value was no longer assigned to kinship organization, but especially to economic structures and modes of production. Theories of under-development (Frantz Fanon), politico-sociological analyses (Immanuel Wallerstein) and the discovery of the peasantry (Henri Medras, Teodor Shanin, Eric Wolf) highlighted the relation between centre and periphery (Jane Schneider/ Peter Schneider), the linkages between politico-economic macrostructures and the local-regional microstructures, and the consequences of capitalist penetration of societies and communities. A perspective in which the respective microcosms were regarded in isolation from the larger social context was thus abandoned. At the same time, it became evident that societies could hardly be seen as isolated, homogeneous entities with bounded identities, for they were historically constituted in mutual interaction.[11]

Despite all the differences between functionalism, structuralism and Marxism (Claude Meillassoux, for instance, criticized the 'idealism' of Lévi-Strauss' reduction of social reality to abstractions), these approaches shared the principle of a construction of structures, which preceded the analysis, and the disregard of the origin and development of those structures. The (dialectical-) analytical categories of *division, opposition and mediation* governed these theoretical constellations. The critique of such structural models, in which the individuals are inescapably locked into the objectified and insurmountable structures that determine their actions, then developed into two directions which aimed, on the one hand, at a hermeneutically guided understanding of the other and the revival of interpretative approaches and intended, and on the other hand, at making the acting subject visible again.

## SYMBOL, MEANING AND INTERPRETATION

The interpretative-hermeneutical turn in the attempt to understand different life-worlds – by Clifford Geertz, in particular – shifted the balances between the familiar anthropological concepts. In a return to the notion of 'culture' – the diffuse use of which was nevertheless criticized (by Kluckhohn, for instance) – the symbolic dimensions of social action and the interpretation of symbol systems, by the means of which human beings perceive and define their worlds, moved centre stage. Referring to Max Weber, Geertz sees the human being as 'suspended in webs of meaning he himself has spun.' Culture is such a web, and the analysis of it is 'therefore not an experimental science in search of law but an interpretative one in search of meaning'.[12] Thus, culture is not conceived of as a cognitively and abstractly ordered system of hidden structures, 'its logic [...] rather derives from the logic of organization of action, from people operating within certain institutional orders, interpreting their situations in order to act coherently'.[13] From this perspective, the world is always already interpreted, and the notion of web does not refer to structures or systems in the structural-functionalist sense, it is not an autonomous, reality-determining sphere, but a system of symbolic meanings to which human beings take

recourse in their actions. In contrast, for instance, to Victor Turner's symbolic anthropology, in which symbols function as operators in processes of social transformation (e.g. status passages), the acts of dissolving social contradictions and familiarizing the individuals with the categories and norms of society, public symbols are seen as vehicles of meanings that form the respective culture, its gestures, actions, events, etc.

This shift to a type of hermeneutics oriented towards theories of language and meaning required a redefinition of the anthropological method, which abandoned the separation of 'understanding' and 'explanation', of 'subjective empathy' and 'objective analysis' and united both moments of the research process in 'thick description'. To look at cultures from 'the natives' point of view', a demand already raised by Malinowski, calls for the interpretation of the symbolic forms – concepts, institutions, actions, forms of behaviour – through which human beings represent themselves and communicate with each other. According to the analogy between text and action, developed with reference to Paul Ricoeur, the activity of the researcher consists, on the one hand, of reading the respective cultural text: 'The culture of a people is an ensemble of texts, themselves ensembles, which the anthropologist strains to read over the shoulders of those to whom they properly belong'.[14] Inscription, on the other hand, as the textualization of actions and speech-acts of human beings, becomes the ethnographic procedure.

Another perspective developed alongside this focus on key aspects of the understanding of culture – *symbol, meaning, interpretation*. This perspective similarly rejected a view of society that denied the existence of acting subjects.

## ACTION, INTERACTION AND NEGOTIATION

The analysis of social action, the orientations of action and its meaning, and of interactions and their motivations had already been emphasized in the perspectives of symbolic interactionism (George Herbert Mead, Herbert Blumer, Erving Goffman) and of transactionalism (Bruce Kapferer) and their critiques of the Durkheimian and Parsonian paradigms of sociology. No longer the determining effect of institutions, norms and values stood in the foreground of the problematization conditioned by individual choice and decision-making on the part of the concretely acting human beings in their respective networks of relationships (Jack Goody, Frederick George Bailey, Fredrik Barth, Jeremy Boissevain).

Similarly, the 'theory of practice', as developed by Pierre Bourdieu in the form of a critique of structuralism, no longer focused on objectified structures but on human action and the strategic use of norms, values and relations, allowing for their manipulation and legitimation as well as their reproduction, thus leading to a linkage of the microanalysis of interactions to the macroanalysis of societies (Plate 97). In Bourdieu's view, social action is not undetermined, since experiences are inscribed into bodies and institutions such that a 'habitus' forms as a specific disposition to act. However, the habitus provides no blueprint for behaviour but rather a set of resources with which situations can be understood and the applicability of rules judged. There is thus always room for strategies of the

individuals; the 'logic of practice', unlike a structural model, unfolds in time and works through the judgment of situations under conditions of uncertainty about rule application.

The shift from systemic approaches and the postulate of the atemporality of objectified structures towards theories of action requires a move from synchronic-static to diachronic-processual analyses, and the emphasis on the specific acting human being brought the question of the temporal organization of actions, the temporal structuration of the life-course and the social conceptions of time and history into view. Or, in Bourdieu's words, 'Practice unfolds in time and it has all the correlative properties, such as irreversibility. Its temporal structure, that is, its rhythm, its tempo, and above all its directionality, is constitutive of its meaning.' 'To reintroduce uncertainty is to reintroduce time ... substituting the dialectic of strategies for the mechanics of the model.'[15]

The emphasis on temporality demanded a reconsideration of historicity in anthropology. Up to this point, historical contexts had largely not been conceptualized as internal processes in anthropological considerations of 'history', but as external factors. Thus, it was not the historical practices of the respective society, but the impact of Western/colonial history on that society that was analysed. At the same time, contemporaneous societies or social groups were often located on a developmental scale and in a unilinear line of progress – as 'people without history', characterized as 'tribal', 'feudal', 'early-capitalist' or 'traditional'. Thus, they were placed 'in another time' and distanced as not being coeval. More recent historical works have, however, emphasized the mutual interdependencies as well as the historical trajectories specific to the various societies, which can hardly be subjected to a universally valid model of the course of history in its Western conception.[16]

Even though *action, interaction and negotiation* stood at the centre of the analysis of culture and society in these theoretical constellations, the opposition of objectivity and subjectivity, of researcher and 'researched', of 'we' and 'other' were hardly questioned at all. Nevertheless, has the recognition of the other as a historical actor in the 'theory of practice' and the insight in the social construction of knowledge been a step in the direction of a critical reflection on the ethnographic constitution and representation of the other and the questioning of the privileged standpoint of the researching subject towards the 'object'?

## DISCOURSE, TEXT AND REPRESENTATION

The movements for liberation and 'the critique of colonialism in the post-war period, which undermined the West's authority to represent other societies, has been reinforced by an important process of epistemological questioning and reflexive theorizing about the limits of representation itself'.[17] In the course of this reflexive movement since the end of the 1960s, the anthropological research practices themselves have been made a topic in hermeneutical-interpretative and language-philosophical studies as well as in post-structural critiques of discourse.[18]

Edward Said's critical study of Western knowledge about the representation of the exotic, about 'Orientalism', demonstrated that the recognition of the other as the object

of knowledge is intrinsically tied to power. Feminist-oriented gender studies[19] contributed to the abandoning of epistemological certainties by showing that anthropological discourses took their own – male-dominated – presuppositions and representations for the characteristics of the respective society. Thus, those social relations, institutions and relations of production in which power and influence are concentrated are often conceptualized as 'the' society, excluding and rendering invisible the female as the other and locking it into a male 'general'.

In the course of such *anthropology*, it was also attempted to clarify the processes of gaining knowledge and of writing in all their aspects and to problematize the web of relations between the researcher and the other as members of different cultures. Following Michel Foucault, the relations between researchers, 'research objects' and addressees of the research are regarded as part of an encompassing relationship between forms of practices and the powerful 'politics of interpretation' (Paul Rabinow) and 'discursive formations and discursive strategies' (Michel Foucault). The search for knowledge is understood as a specific historical form of social practice, representing particular forces in society.

In this context, attention is focused on the processes of making and marking the other in time and space, the passing from coevality in fieldwork to the distancing in analysis, conceptualization and text,[20] and on the various strategies of establishing ethnographic authority as well as on the literary procedures and tropes (Hayden White) in ethnographic representations. This emphasis on the construction of the other obviously reflects one of the core problems not only of anthropology, but of scientific practices in general: the division of subject and object considered as distinct, coherent, stable and homogeneous entities, and the attempt to overcome this dichotomic separation by emphasizing the dialogical character of interaction in the research process and the shared construction of reality. In these perspectives, cultural interpretations and the interpretations of culture are located in many sorts of reciprocal contexts, obliging writers to find diverse ways of rendering negotiated realities as multisubjective, contested, power-laden and incongruent. In these views, the writings on culture and society are considered as relational, as inscriptions of performed interactions in communicative processes that develop historically between subjects in relations of power.

But even in these approaches, organized around the topics of *discourse, text and representation*, anthropological reflexion and the revision of its modes of knowledge generation appear to be reserved to those who are part of this discursive tradition. The world, or so it seems, continues to be ordered from the point of view of Western anthropologists, and particular systems of knowledge remain subordinated to the exigencies of critical metatheory.

Members of various societies have long analysed their 'own' culture.[21] Although the epistemological paradigms Lévi-Strauss once recommended in a hegemonic gesture – 'wherever populations remain physically strong while their culture rapidly veers towards our own, anthropology, progressively taken over by local scholars, should adopt aims and methods similar to those which, from the Renaissance on, have proved fruitful for the study of our own culture'[22] – are being questioned, the dominating

influence of Western disciplines and their conceptual categories, which are considered as being universal tools for cognition and explanation of social life, on the respective systems of knowledge has only recently become a subject of interest to scholars.

'Other cultures gain legitimacy only as objects of thought – never as tools of thinking ... The conditions for the participation of the non-Western anthropologist in the sociological discourse is the active renunciation of the present potential of his or her culture'.[23] 'Why cannot African concepts of society, social groups, social processes, and the like, derived from African ways of codifying reality, be used to draw our attention to other distinctive elements in the disciplinary matrix of sociology?'[24] Does the description of their 'own culture' demand of its members to distance themselves from their 'own' traditions of knowledge and to move solely within the representations and modes of writings in which they have been written about? Thus, the fundamental question of anthropology of the relation between 'self' and 'other' is posed anew, and the exploration of this relation becomes a new challenge to a mode of thought that refuses the construction of homogeneous identities and categorical differences between 'us' and 'them', 'the West and the rest' as well as the incorporation and annihilation of differences. Culture 'is not an object to be described, neither is it a unified corpus of symbols and meaning that can be definitively interpreted. Culture is contested, temporal and emergent. Representation and explanation – both by insiders and outsiders – is implicated in this emergence'.[25] If anthropology, however, is at work at the creation and conservation of interpretations, at building an archive and a library of meanings, then it is high time for those meanings and interpretations to be no longer merely catalogued but also brought to use.

## NOTES

1.   G. W. Stocking, 'The Ethnographer's Magic: Fieldwork in British Anthropology from Tylor to Malinowski', in G. W. Stocking (ed.), *Oberservers Observed: Essays on Ethnographic Fieldwork*, Madison, WI, 1983, p. 109.

2.   A. A. Akiwowo (ed.), 'Sociology in Africa Today', in *Current Sociology*, Vol. 28, pp. 23–77, 1980; T. K. Oommen and P. N. Mukherji (eds), *Indian Sociology-Reflections and Introspections*, Bombay, 1986.

3.   C. Lévi-Strauss, *Structural Anthropology* (trans. C. Jacobson and B. Grundfest Schoepf), New York, 1967, p. 378–84.

4.   F. W. Voget, *A History of Ethnology*, New York, 1975, p. 400.

5.   See L. Mair, 'The Social Sciences in Africa South of the Sahara: The British Contribution', in *Human Organization*, Vol. 19, No. 3, 1960, pp. 97–107.

6.   S. B. Ortner, 'Theory in Anthropology since the Sixties', in *Comparative Studies in Society and History*, No. 26, 1984, p. 135.

7.   Ibid., p. 136.

8.   T. Asad (ed.), *Anthropology and the Colonial Encounter*, London, 1973.

9.   A. Blok, 'Anthropology in Western Europe: Recent Trends and Perspectives', in M. Dierkes and B. Biervert (eds), *European Social Science in Transition: Assessment and Outlook*, Frankfurt, Germany, and Boulder, CA, 1992, pp. 123–42.

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11.   E. R. Wolf, *Europe and the People without History*, Berkeley and Los Angeles, CA, 1982.

12.   C. Geertz, *The Interpretation of Cultures, Selected Essays*, New York, 1973, p. 5.

13.   S. B. Ortner, op. cit., p. 130.

14.   C. Geertz, op. cit., p. 452.

15.   P. Bourdieu, *The Logic of Practice*, Cambridge, UK, 1990, pp. 81, 99.

16.   M. Sahlins, *Historical Metaphors and Mythical Realities: Structure in the Early History of the Sandwich Islands Kingdom*, Ann Arbor, MI, 1981; R. Price, *First-Time: The Historical Vision of an Afro-American People*, Baltimore, MD, 1983; R. Rosaldo, *Ilongot Headhunting, 1883–1974: A Study in Society and History*, Palo Alto, CA, 1980.

17.   J. Clifford and G. Marcus (eds), *Writing Culture: The Poetics and Politics of Ethnography*, Berkeley and Los Angeles, CA, 1986, p. 10.

18.   J. Clifford and G. Marcus, op. cit.; M. Manganaro (ed.), *Modernist Anthropology: From Fieldwork to Text*, Princeton, NJ, 1990; G. E. Marcus and D. Cushmann, 'Ethnographies as Texts', in *Annual Review of Anthropology*, No. 11, 1982, pp. 25–69; J. Ruby (ed.), *A Crack in the Mirror: Reflexive Perspectives in Anthropology*, Philadelphia, PA, 1982; B. Tedlock, 'From Participant Observation to the Observation of Participation: The Emergence of Narrative Ethnography', in *Journal of Anthropological Research*, Vol. 47, No. 1, 1991, pp. 69–94; S. Tylor, *The Said and the Unsaid*, New York, 1978; S. Webster, 'Realism and Reification in the Ethnographic Genre', in *Critique of Anthropology*, Vol. 6, No. 1, 1986, pp. 39–62.

19.   M. Z. Rosaldo and L. Lamphere (eds), *Women, Culture and Society*, Palo Alto, CA, 1974.

20.   J. Fabian, *Time and the Other: How Anthropology Makes Its Object*, New York, 1983.

21.   J. Kenyatta, *Facing Mount Kenya: The Tribal Life of the Gikuyu*, London, 1979; M. C. Yang, *A Chinese Village, Taitou, Shantung Province*, New York, 1945; D. R. Arkush, *Fei Xiaotong and Sociology in Revolutionary China*, Cambridge, MA, 1981; S. Altorki, *Women in Saudi Arabia: Ideology and Behaviour among the Elite*, New York, 1986.

22.   C. Lévi-Strauss, 'Anthropology: Its Achievements and Future', in *Current Anthropology*, Vol. 7, No. 2 (Apr.), 1966, p. 126.

23.   V. Das, 'Der anthropologische Diskurs über Indien: Die Vernuft und ihr Anderes', in E. Fuchs and M. Fuchs (eds), *Kultur, soziale Praxis: Text Die Krise der ethnographischen Repräsentation*, Frankfurt, Germany, 1993, pp. 410. See also T. K. Oommen, *Alien Concepts and South Asian Reality: Responses and Reformulations*, Thousand Oaks, CA, and New Delhi, 1995.

24.   A. A. Akiwowo (ed.), 'Sociology in Africa Today', in *Current Sociology*, Vol. 28, 1980, p. 5.

25.   J. Clifford and G. Marcus, op. cit., p. 19.

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# 19.3

# ARCHAEOLOGY

## *Andrew Colin Renfrew*

During the course of this century, it has at last become possible to construct a coherent account of the history of humankind from its origins millions of years ago among the anthropoid apes to the present-day world. Over the greater part of this period, the methods of archaeology offer the only source of information available to us, as written records only go back to about 3000 BC. The development of the discipline of archaeology has of course been furthered by the success of the important and dramatic excavations of such sites as the royal graves at Ur in Iraq or the discovery of the treasures in the tomb of the Egyptian pharaoh Tutankhamun – both undertaken in the 1920s[1] – or the discovery of the early hominid fossils in the Olduvai Gorge in Kenya and other sites in East Africa.

Discovery through fieldwork is only one part of the history of the discipline, however, and may ultimately be considered less significant than theoretical and methodological advances. The application of new research techniques, notably radiocarbon dating, has indeed revolutionized the archaeological enterprise, allowing the discovery and successful investigation of occupation sites in every part of the world. New intellectual approaches have transformed the way we think about the past and our perception of our place in it as human beings. These advances have permitted the emergence of what we may term a 'global view', allowing contemporary changes and developments around the world to be compared with one another. The story of the peopling of the Earth can be told with increasing precision, and the process by which significant developments, such as the origins of farming or the development of cities, have occurred at different places and times may be considered. In 1961, the British archaeologist Grahame Clark published the first edition of his *World Prehistory*. This constituted a landmark, for it initiated an era in which a worldwide vision, largely supported by radiocarbon dating, became possible. All these achievements were established, however, upon the solid foundation laid in the early development of archaeology during the nineteenth century.

## THE FOUNDATIONS

Modern archaeology is based upon a range of techniques. Some of these, like radiocarbon dating, are products of the twentieth century. However, the most fundamental technique – systematic stratigraphic excavation – was developed in the nineteenth century, so that by 1914 significant archaeological research was underway in many parts of the globe.[2] Already in 1859, two fundamental principles had been established: the theory of evolution was set out systematically by Charles Darwin in *The Origin of Species* and was soon applied to human culture and society as well as to the emergence of our species. The distant past of humankind was established the same year, when the flint artifacts found in the gravel quarries of the River Somme in France demonstrated that human history extended into the ice ages far beyond the traditional date of Creation, which biblical scholars had placed at 4004 BC.

## THE RISE OF ARCHAEOLOGICAL SCIENCE

The principal problem for archaeology has always centred on dating. The method of stratigraphic excavation offers a means of arranging archaeological finds into a sequence, what one may term 'relative dating', but the problem of assigning a date in calendar years – that is to say of 'absolute dating' – was the crucial one for a long time. Various techniques, relying on solar radiation, the rate at which sediments are deposited, and the supposed durations of glacial and interglacial periods, were painstakingly developed. It was not until the advent of radiometric dating – with the use of methods based upon the constant rates of radioactive decay of suitable isotopes – that reliable methods became available. For distant time periods, measured in millions of years, slow decaying isotopes are appropriate, and the potassium-argon method is one of the most important. However, for artifacts or sites of the past 40,000 years, radiocarbon dating, developed in 1949 by Willard Libby,[3] has pride of place. For the first time, it became possible to use a laboratory-based method, operating quite independently of historical assumptions about the archaeological samples in question, to assign dates to organic materials found during excavations. Finds in the Americas or in Australia could be dated on the same basis as finds in the Old World. Reliable chronologies could now be established for areas for which no written records of any

kind existed until recent eras. Fundamental changes in our vision of world prehistory emerged during the 1960s and 1970s as a result, and the 'radiocarbon revolution' enabled researchers to date the striking 'megalithic' tombs of north-western Europe, for example, far earlier than the pyramids of Egypt, which had previously been thought to have served as the model for the European tombs.

Prospecting methods, and in particular the use of aerial photography and satellite imaging, have allowed experts to discover archaeological sites much more efficiently. A series of techniques, some of which were developed in the nineteenth century, can be used to reconstruct the environment and the diet of early populations. Since the Second World War, the new discipline of archaeological science has developed, with such sub-fields as environment archaeology, geo-archaeology and archaeometallurgy. Research in these fields is now published in such specialized periodicals as *Archaeometry* and *The Journal of Archaeological Science*. Mention should also be made of the application of molecular biology, which offers promising new opportunities for archaeological science.[4]

## INTELLECTUAL DEVELOPMENTS

The great archaeological synthesizer of the twentieth century was undoubtedly the Australian-born Vere Gordon Childe (1892–1957). His first contribution[5] was to produce an overview of the development of prehistoric Europe,[6] building on the achievements of such predecessors as the Swede Oscar Montelius. In doing so, he formulated and defined the concept of the archaeological 'culture'. He saw prehistoric Europe as fundamentally influenced by ancient Western Asia, by a process which he termed 'the irradiation of European barbarism by Oriental civilization'. His second great contribution was to achieve an unparalleled understanding of farming, whose importance he was the first to emphasize in his term 'the Neolithic Revolution'. Later referring to the rise of complex society and civilization, he coined the term 'Urban Revolution'.[7]

The first of these achievements, based upon a general view of the diffusion of culture from the Near East to Europe, has not stood the test of time, and more particularly the radiocarbon revolution, although the importance of Childe's European synthesis remains considerable. The second, Childe's view as expressed in *What Happened in History* (1942), marked a turning point. It helped to inspire some of the major post-war fieldwork projects on the origins of agriculture, such as that organized by Robert J. Braidwood in Iraqi Kurdistan. Similarly, it helped to encourage research into the origins of civilization not only in the Near East but in the Americas as well.[8]

A radical re-assessment of the existing traditions of archaeological thought was undertaken in the 1960s by Lewis Binford in a series of papers published in *American Antiquity*.[9] The so-called 'New Archaeology' or 'processual archaeology', initiated by Binford and his colleagues[10] in the United States and by British and Scandinavian scholars,[11] was critical of the diffusionist thought and of the emphasis upon classification favoured by traditional archaeologists. They preferred to emphasize the processes of change operating within societies, including demographic, social and technological processes. They embraced the environmental approach offered by developments in archaeological science

and turned to the philosophy of science for an intellectual framework that was less subjective than what they sometimes described as the 'pseudo-history' of their predecessors. More rigorous, often computer-aided, analysis was one of their objectives, with an emphasis upon research design and the testing of hypotheses. Although controversial, this was, in many ways, a breath of fresh air, but the rather unimaginative application of some of these principles[12] led to objections that this approach was 'scientific' and undervalued the role of the human individual.[13] Certainly there was some justification to the criticism that the 'New Archaeology' had overlooked the importance of the symbolic aspects in human thought and action, and the last two decades of the century have seen the development of 'post-processual' or interpretive archaeologies,[14] which take a more subjective approach, avoiding what they see as the false objectivity of science, sometimes urging that archaeological research should have a motivation that is overtly political.[15]

The 'interpretive' critique of processual archaeology has certainly infused new life into the theoretical debates that have characterized archaeology over the last third of the century. However, in the eyes of some,[16] hostility towards scientific method, and emphasis on the subjectivity of interpretation can lead to a dangerous relativism where 'anything goes'. Meanwhile several specialists, continuing to work within the traditions of what can be termed cognitive-processual archaeology, have sought to explore the symbolic and cognitive devices of early societies.[17] One of the most notable features of archaeology at the end of the century is the lively nature of such discussions and the emergence of varying new approaches, including feminist archaeology.

While these debates have been most spirited in Britain and in the United States, it should be noted that the Marxist tradition in archaeology was also inherently processual rather than diffusionist, and neo-Marxist thinkers in France, Denmark and Mexico have conducted their own re-analysis of traditional archaeologies.

## THE EMERGENCE OF WORLD ARCHAEOLOGY

With the end of the colonial empires, the later part of the century has witnessed the development in many parts of the world, along with a new national awareness, of a renewed interest in the past, and particularly in the past of indigenous communities. In Africa, for instance, the artistic achievements of the kingdoms of Ife and Benin, in what is now Nigeria, are now more widely recognized as sophisticated products well worth comparison with the accomplished works of ancient western Asia or the classical world. The nation of Zimbabwe today takes its name from a major monument that dates back to before the time of European influence. Prior to independence the origins of Zimbabwe, which had been documented by Gertrude Caton Thompson in 1931, were officially denied, and a European origin was claimed on the basis of what can only be termed racist assumptions. With the passing of colonialist thought, the importance and interest of local archaeologies is much more widely recognized, and areas formerly little-explored archaeologically, such as South-East Asia, or the islands of the Pacific, are now being more intensively investigated.

Other areas, such as China, have antiquarian traditions going back many centuries. Modern archaeology, however, based on systematic fieldwork using stratigraphic excavation, began there with the research of Andersson in 1934 and has since made significant strides. Archaeology in China flourished greatly under communist rule. Indeed it has generally been the case that Marxist regimes have followed the lead given by Marx and Engels themselves in emphasizing the importance of archaeology for an understanding of the foundations of society. In the Soviet Union, there was considerable investment of resources during and after the Stalinist era, although it is fair to say that intellectual debate was somewhat restricted. Fieldwork and archaeological science, however, flourished.

Archaeology is also increasingly contributing to our understanding of those periods for which written evidence is available. This has always been the case for the ancient civilizations of Egypt and Western Asia. But the archaeology of the classical world (i.e. ancient Greece and Rome) is developing to the extent that many conclusions are now drawn as much from archaeological as from written evidence. The same is true for the medieval period in Europe, and industrial archaeology is now a well-established field both there and in the United States.

Mention has been made of research into the agricultural and urban revolutions, which we now know took place independently in several parts of the world. The problem of orientation arising from the new questions resulting from theoretical considerations is as important as the new research techniques made available by archaeological science.

However, archaeology's greatest contribution during this century has been to expand our understanding of the origins of humankind. Many of the earliest discoveries of fossil humans were made in Europe in the nineteenth century: the distinction between the two Upper Palaeolithic varieties, Neanderthal and Cro-Magnon man (our own species, *Homo sapiens sapiens*), were by then well established, and their origins in Europe are now known to date back as far as 40,000 years ago. However, the first examples of ancestral forms, initially termed *Pithecanthropus* ('ape man') and now called *Homo erectus*, came to light at the turn of the century in Java, and were followed by the discovery of 'Peking man' in the 1930s through the excavations at Choukoutien in China. *Homo erectus*, which has since been further documented by discoveries in Africa, is now known to have flourished between 1.5 million and 500,000 years ago. In 1925, Raymond Dart announced the discovery in Southern Africa of fossilised remains of *Australopithecus*, which is now recognized as a still earlier and ancestral hominid whose origins (in the form of the famous fossil 'Lucy') can be traced back 3.5 million years ago in Ethiopia.[18] The development from *Australopithecus* to *Homo erectus* has been comprehensively documented in the important excavations of Louis and Mary Leakey in the Olduvai Gorge in Kenya.[19] It now appears clear that the earliest stages in human evolution took place in Africa, and it was from there that *Homo erectus* migrated to western Asia, to East and South-East Asia and to Europe. Our own species developed from *Homo erectus*, and this process also seems to have taken place in Africa, about 100,000 years ago, although how far parallel and related developments may have been occurring in Europe and Asia is not yet fully understood.[20] With the beginning of the Upper Palaeolithic

period, some 40,000 years ago, the picture is much clearer, and it is now possible to give a reliable outline of the human colonization of the globe.[21] This new understanding of humankind's past, which is continuously being corrected and refined, and to which molecular biology is beginning to make a contribution, is one of the principal achievements of more than a century of archaeological research. It allows us to assert with great confidence the fundamental unity of the whole of humankind and to document in a detailed way the manner in which each continent and country of our world came to be peopled.

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# 19.4
## DEMOGRAPHICS

*Tian Xueyuan*

The history of demography dates back to John Graunt, who is recognized as the 'father of demography' due to his publication *Natural and Political Observations Made upon the Bills of Mortality* of 1662. Since then, the subject of demography has developed as an independent discipline. For the last 200 years, however, demographic specialists have concentrated more on population studies from a sociological and economic perspective than on statistics. In particular, the study of demographics has been greatly influenced by Thomas Robert Malthus' *An Essay on the Principle of Population*, an immensely popular yet controversial work first published in 1798 and reprinted six times over the following 28 years. Malthus' principle of population nurtured debate between anti-Malthusianism and neo-Malthusianism, whose proponents adapted the principle to modern contexts. At the dawn of the twentieth century, the field of demographics was entering a new phase not only because of the ongoing debate over Malthus' principle but also due to successive breakthroughs in population studies.

The demographic developments in the twentieth century can be divided into two distinct periods: before and after the Second World War. The major demographic breakthroughs that occurred in the first period gave rise to the interdisciplinary character in the field after the Second World War.

### EXTENSIVE DEMOGRAPHIC BREAKTHROUGHS PRIOR TO THE SECOND WORLD WAR

Malthus' principle made such a great sensation when it was formulated in the late eighteenth century largely because of the rapid growth of Europe's population at that time. However, this situation changed substantially at the beginning of the twentieth century. Although world population was still growing in an unprecedented manner, the population birth rates and natural growth rates in Europe, and especially western and northern Europe, were decreasing, thus resulting in low population growth. It was in this context that the demographic transition theory was formed. In his article on demographic theories published in 1909 and in *Demographic Revolution* published 20 years

later, French scholar A. Landry explored population transition in his discussion of three different stages of population development. Through a different method, Warren Thompson in America reached similar results. Thompson grouped the world's population into three regional types with different fertility and mortality levels corresponding to specific transitional stages.

### The theory of optimum population

The debate over Malthusian population theory prompted some economists and demographers to ponder the crucial question of the optimum size of population. Edwin Cannan's 1914 book entitled *Wealth* is generally regarded the first publication to address the issue of optimum population. Cannan defined optimum population as the population size capable of generating the maximum industrial and agricultural return. The notion of optimum population was further developed by Carr-Saunders in his *Population Problems*. According to Carr-Saunders, the optimum population is determined by the maximum individual benefits or the highest living standard. Owing to the fact that it did not stress the issue of over- or underpopulation, the theory of optimum population enjoyed popularity in the field of demography during the 1920s and 1930s.

### Economic school

The demographic factors were generally dealt with as dependent variables in the theories of classical economics and 'vulgar economics'. It was not until the early twentieth century that some economists began to deal with demographic factors as independent variables of economic growth, which represented great progress. John Maynard Keynes, author of the landmark work *The General Theory of Employment, Interest and Money* (1936), was perhaps the most influential figure in this period. Keynes argued that the economic crisis and depression of 1929–33 was caused by insufficient effective demand, which in turn was determined by such factors as population, consumption level and technological composition of capital. Moreover, he believed that decreasing population growth rates were critical to reach sufficient

effective demand. Keynes thus explained the determinant role of population factors in economic development, which also constituted a part of his 'stagnant economy'. American and British economists A. B. Hansen and R. F. Harrod developed Keynesian ideas further within the influential economic school of demography.

### Sociological school

During this same period, population studies from a sociological perspective also made great breakthroughs. In his theory of 'social capillarity' (*la capillarite sociale*) proposed in the early twentieth century, French sociologist A. Dumont explained that the individual's pursuit of self-development was linked to his desire and that so-called social capillary action was conducive to the decline of fertility. During this period, the diverse approaches by sociologists in their analyses of demographic issues greatly encouraged studies on the themes of fertility, population transition and optimum population.

### Mathematical school

For about 200 years, demography, as the study of statistics, had made no revolutionary breakthrough until the early twentieth century, when A. J. Lotka formulated his stable population theory and Raymond Pearl and Lowell J. Reed rediscovered the logistic curve. By mathematical deduction, Lotka worked out a basic formula for a stable population model and demonstrated the need to achieve stable age structure in a closed population in the case of constant age-specific fertility and residual death rates, providing the reproductive term is sufficiently long. By explaining the S-shape curve of population change from low to high and back to low growth, Pearl and Reed resurrected the logistic curve idea elaborated in the nineteenth century and thus provided a new methodology for exploring population transition using mathematics and statistics.

## POST-WAR DEVELOPMENTS – INTERDISCIPLINARITY

Demographics in the period following the Second World War adopted an interdisciplinary approach on the basis of breakthroughs made in the first half of the century. After the war, world population growth accelerated due to the baby boom. The problems of poverty, unemployment, famine and pollution became so serious that Malthusian population theory was resurrected. Two proponents of neo-Malthusianism, F. A. Pearson and F. A. Harber, published a series of works on the themes of world hunger and the global population crisis in the 1940s. In the 1970s, pessimistic population theory expounded in works such as *The Doomsday Book* by G. Taylor and *Limits to Growth* by D. H. Meadows et al. were influential.

### 'Demographic transition theory'

On the basis of the work of A. Landry and W. Thompson, American demographer F. W. Notestein constructed the theoretical model of population transition described in his publications *Population: The Long View* and *Economic Problems of Population Change*. The population transition theory attained worldwide recognition through the *Population Growth and Economic Development in Low Income Countries* by A. J. Coale and E. Hoover, who applied the theory to developing societies.

### Progress in economics of demography

The relationship between population change and economic development has been a focus of demography since the field's inception. New advances in the economics of demography since the Second World War were made at both the macro and micro levels. At the macro level, the outstanding contemporary demographic economist J. J. Spengler analysed the relationship between population and food supply in *Economics and Demography*, published in the 1950s. He stressed the need for population growth control by arguing that a population increase would lead to serious problems related to food, land, water and mineral resources given the increased demand for food resulting from higher income. The introduction of development economics opened up a new field in the economics of demography. In his studies on the relationship between population and economic growth in developing countries, Coale emphasized the influence of population on economic growth by arguing that savings and investment must grow by an annual rate of 3 per cent if population growth rates remained 1 per cent, given a of capital input-output ratio of 3:1. W. A. Lewis developed demographic macroeconomics by placing such factors as population and labour into a framework of modern development economics in his analysis of the shift of labour from traditional to modern industries.

At the micro level, H. Leibenstein constructed his theory of children's costs and benefits by classifying the costs as direct or indirect and by dividing the benefits into six categories, e.g. labour-economic and consumption-enjoyment benefits. In exploring children's costs and benefits among families of different social levels, Leibenstein explained the process of the decision to reproduce. In his analysis, G. S. Becker introduced the concepts of invariable or quantity costs and variable or quality costs. Moreover, he attempted to prove that the substitution between the quantity and the quality costs and the general law of increasing quality require flexibility. It was this law that expressed the necessary shift of investment from quantity to quality costs, which ultimately determined fertility decline. Other noteworthy concepts in demographic microeconomics are R. A. Easterline's theory of children's supply and demand, the 'inter-generation inflows of property' by J. C. Caldwell, and 'household economics' by T. W. Schultz.

### Formation and development of sociological demography

The population studies from a sociological perspective such as the 'social capillarity theory' did not result in the formation of sociological demography in the period after the Second World War. At that time, many sociologists

interested in the field of demography, such as K. Davis and P. Hauser, tried to provide sociological explanations for population size, quality and structure. In the 1960s and 1970s, Davis addressed the issue of population and stability and the relationships between population and urbanization in his analysis on the themes of 'population urbanization' and 'crisis in world population.'

## Development of mathematical demography

Owing to the extensive application of mathematical methodology, demographers improved their traditional methods by means of computer technology. As mathematicians and scientists in systematic dynamics began working or collaborating in the field of demography, mathematical demography as an interdisciplinary subject developed. Thanks to the methodological revolution in demographic data collection and modification, population projection and demographic quantitative analysis, mathematical demography greatly facilitated the overall development of demography and the formation of an overall demographic system.

## Studies on population and sustainable development

Studies on population and sustainable development have a long history. Many theoretical models on population, food, resources, environment, and social and economic development were constructed by quantitative methods of systematic dynamics in the second half of the twentieth century. One noteworthy example is *Limits to Growth* by D. H. Meadows, published in 1972, when the concept of 'sustainable development' was first put forward at the World Conference on Environment held in Stockholm. A report of the World Commission on Environment and Development, *Our Common Future* (1987), popularized the notion that development is sustainable only if 'it meets the needs of the present generation without compromising the interests of future generations'. Since the United Nations Conference on Environment and Development (Rio de Janeiro, 1992), the International Conference on Population in (Cairo, 1994) and the World Summit for Social Development (Copenhagen, 1995), 'sustainable development' has become one of the most important topics at the beginning of the twenty-first century. Thanks to the critical role of population in sustainable development, studies on such topics are being undertaken in many countries.

In the twentieth century, demography gradually became a discipline with its own specific objects, methodology and scope. The current system of demography includes a range of independent sub-disciplines such as demographic statistics, the economics of demography, sociological demography, population geography, development demography, and mathematical demography. Since development is an ongoing process, there is no doubt that demography will progress further alongside social and economic development and advances in science and technology in the twenty-first century.

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# 19.5
# SOCIOLOGY

*Peter Wagner*

## SOCIOLOGY STRUGGLING TO BE BORN

The unique status of sociology among the social sciences can be attributed to the fact that there is no realm or aspect of social life in which sociologists can claim specific competency. At the beginning of the twentieth century, when most of the other social science disciplines discussed in this chapter were relatively well established, sociology was still struggling to come into existence.

L'Institut International de Sociologie (IIS) was founded in Paris in 1893, and at about the same time Emile Durkheim set out his methodology in *The Rules of the Sociological Method* (Plate 98). Similar but less successful treatises for the new discipline as well as overviews of its development were published in many European languages in the closing decades of the nineteenth century. Several national associations were formed shortly after the turn of the century, e.g. the American Society for Sociology (1905), the German Society for Sociology (1909), the Society of Japanese Sociology (1912) and its more liberal counterpart, the Japan Sociological Society (1923), and the first Petrograd-based Russian Sociological Society (1916). But this flurry of new activity could not hide the fact that this newcomer was often perceived as an upstart by academic institutions. Consequently, its somewhat unwelcome arrival on the scene was often obstructed. The University of Oxford, for instance, considered the teaching of what came to be known as the social sciences to be the exclusive domain of 'philosophy, politics and economics'. And in Italy, Benedetto Croce spoke for many philosophers when, in 1906, he called sociology a 'chaotic mixture of natural and moral sciences ... a new science, which is unjustifiable as a philosophical science and nothing new as an empirical science or anything else. It is new only as "sociology", that is as a barbaric positivistic incursion into the domains of "philosophy and history"'.

What was at issue when the field of sociology was defined? Sociology studied contemporary Western society; it did not claim special expertise concerning the past, as did history, or concerning other societies, as did anthropology. Moreover, sociology could not claim any field of analysis directly comparable to the relations of production and exchange as for economics, to the modes of setting and implementing common rules as for political science or to the workings of the soul in the case of psychology. As a consequence, some sociologists, like Emile Durkheim, boasted that they provided the most comprehensive study of all social relations, subordinating all other fields. More modest sociologists endeavoured to complement the substantive fields of inquiry by studying the actual form of social relations, as Leopold von Wiese in Germany. The former claim invariably aroused opposition from scholars of more established disciplines, and the latter, while more acceptable, could hardly be considered very appealing.

Both Durkheim's and von Wiese's characterizations of sociology already addressed the issue in the terms of academic institutions and disciplines, and they formulated proposals for entry into the universities. To fully understand the contested nature of sociology as well as the expectations and the fears that it provoked at the end of the nineteenth century, we must examine sociology in broader terms. Although the discipline appeared in the twentieth century, the formulation of its ambitions dates back to the early nineteenth century.

### The promise of sociology: understanding 'modern society'

The emergence of sociology can be traced back to the period immediately following the American and French revolutions. This discipline is decisively marked by liberal thinking since it does not take social order for granted and does not consider it endowed by some superior extra-human authority. At the same time, however, it breaks with the liberal political philosophy of the seventeenth and eighteenth centuries by insisting that there is a social reality between individuals and the polity. From a sociological point of view, political order cannot be understood as the result of some agreement between atomistic individuals; its form and substance rather is related to a structure of social relations; the task of sociology is to identify and analyse that structure.

Thus, sociology marked its difference from economics and psychology, on the one hand, and political science and law, on the other, less by carving out a specific realm of social life than by developing a distinctive perspective. It

focused on sociality as a human characteristic and on the emergence of society, defined as a structured set of social relations between human beings. This phenomenon was neither the inadvertent result of multiple independent preferences nor identical to the formal set of common rules known as law and institutionalized in the state.

To frame the issue in such terms meant that sociology was 'modern' in the sense that it accepted the assumptions and outcomes of the revolutions: human action, being autonomous, could not be subjected to imposed laws. Consequently, human social life developed along novel paths and broke with earlier human societies. But this did not imply that the new situation was basically well grasped by individualist liberalism or that it was unknowable because of the unpredictable nature of autonomous action. In contrast to both these views, sociology proposed to make the new set of social relations intelligible through the study of social relations and the emergent social order. In this sense, sociology posed as the science of 'modern society' per se, with its own very distinctive programme.

At this point, it should also be noted that sociology, thus understood, is indeed a 'Western' discipline, at least in historical perspective, for it originally emerged in Western Europe and the United States. Even the early followers elsewhere, in Russia or Japan for instance, referred to Western examples. In some areas, however, forms of sociological thought emerged strongly and addressed the liberal heritage in critical terms, by proposing organismic or other holistic views of society. This was notably the case in Germany, the United States and in Japan, where authentic responses to 'Western' modernity were sought. Furthermore, the original programme itself was transformed during the twentieth century, and in the process, sociology's original problematic was mitigated. But even these developments cannot be understood if not placed in historical context.

Though not referred to under the name of sociology, a term coined by Auguste Comte in 1838, the outlines of this programme were identifiable early in the nineteenth century, most clearly in Hegel's *Elements of a Philosophy of Right*. During the first half of that century, however, it could hardly assert itself against the 'old' state sciences on the one hand, and the 'new' political economy on the other. During the second half of the nineteenth century, in contrast, under the influence of evolutionist thinking, many of the questions sociology posed seemed to have already found answers in a broadly determinist perspective on historical progress. The work of Herbert Spencer is the most important case in point. It was only towards the beginning of the twentieth century that the project of sociology as a research programme and a discipline was revived.

## 'CLASSICAL SOCIOLOGY' – AN EPISTEMOLOGICAL, POLITICAL AND INSTITUTIONAL PROJECT

The early twentieth century was not only marked by the creation of sociological associations and programmatic treatises: it is also now known as the period of *classical sociology*, the era of the discipline's founders, most notably Emile Durkheim and Max Weber (Plate 99), but also Vilfredo Pareto, Georg Simmel, Charles Horton Cooley and George Herbert Mead among others. Not all of these scholars were regarded as key advocates of the discipline in

their lifetimes, and to some extent this period's recognition as a classical phase occurred after the event, not least through Talcott Parsons' 1937 work *The Structure of Social Action*, which pointed out similarities between those scholars and claimed that their theories actually converged – unknown to the authors themselves – on a sociological theory of human action. Regardless of the validity of this particular claim, the works of the 'classical' period were held together by at least two common problematics: an epistemological and political one.

Around the turn of the century, academic debate was marked by an acute awareness of a deep-rooted crisis of science – despite, or perhaps because of, the enormous development of the sciences during the nineteenth century. Ernst Mach's logical positivism, Wilhelm Dilthey's separation of the models of the natural and the human sciences, and Friedrich Nietzsche's radical critique of science were among the most profound European expressions of these doubts. In the United States, William James and Charles Peirce developed the pragmatist response to similar doubts, a response that appeared to lead the way to further scientific activity. Regardless of the particular context and position taken, the classical sociologists addressed the issue of the possibility of social knowledge in their extensive writings on epistemology, ontology and methodology. The major sociological approaches that still exist today emerged from these works. An early statistical-quantitative approach to social causality can be traced to Durkheim's study of suicide and the works of Durkheimians like François Simiand. Interactionist-qualitative analyses of social relations have their origins in Georg Simmel's observations of social life in Germany as well as in social psychology and theories of the self expressed by George Herbert Mead and the Chicago School in its later works. Historical and comparative studies of institutional and cultural constellations and developments owe much to the work of Max Weber.

In this sense, the so-called founders can justifiably be seen as laying the groundwork for the development of sociology as a discipline in the social sciences. And their efforts were also honoured by some, albeit modest, institutional success in establishing sociology in the universities. In the United States, the early sociological work took place in a context of university expansion and creation. It was thus comparatively easy to secure a place for a new field. In France, Durkheim's very conscious efforts resulted in a 'halfway failure'. He succeeded in establishing hegemony for his 'French school of sociology', as it was later called, among the competing social science approaches, but after his death the dominance of philosophy at French universities reasserted itself at the expense of sociology, which had to wait until the 1950s to be recognized as a degree subject. In Germany, authors, including Weber, were reluctant to use the term *sociology* with its taint of abstract Enlightenment thinking because it was often considered alien to the German mind. The political upheaval of the First World War and the end of imperial Germany, however, paved the way for the introduction of the study of contemporary society and its problems – even if only peripherally as advocated by von Wiese – at universities, including those recently founded such as in Cologne and Hamburg. A similarly rapid institutionalization occurred in Poland during the interwar period.

However, there is more to observe in this so-called process of founding a discipline. As mentioned above, the

early sociologists did not only share an intellectual context critical of science but also a political context that can broadly be defined as a crisis of liberal thought in an emergent industrial mass society. During most of the nineteenth century, in the wake of the democratic revolutions in the United States and in France, liberalism and liberal theorizing occupied centre stage in intellectual debates on politics. At the end of the century, however, intellectuals were generally well aware of the failure of liberal theory, in politics as well as in economics, either to understand the changes in societal practices or to provide criteria for their regulation.

In those *fin-de-siècle* debates, the classical sociologists agreed that societal developments had superseded classical liberalism but insisted that revisions had to be made within that political tradition. They viewed the contemporary situation as one in which a major political restructuring was occurring without a clear objective or guiding vision. They turned this into their major theme: incapable of adhering to the idea of a quasi-automatic regulation of social conflicts but unwilling to move completely away from the tenets of bourgeois liberalism, they devoted their analytical efforts to searching for those phenomena that might provide for the sustainable development of society.

Theories of *organic solidarity* and the relationship between religion and morality in Durkheim, between forms of legitimate domination and *charisma* in Weber, between the political class and the *circulation of elites* in Pareto were the results of such attempts at redefining orderly relationships between extended social practices, uprooted social identities, and polities in need of adaptation. Classical sociology provided important components of a possible diagnosis of the period's major social transformations.

It has also to be noted, however, that the emphasis on sociology to make an intellectual contribution to a political restructuring was not to be had without a price. What came to be known as sociology was only one part of a broader intellectual domain that addressed the crises of knowledge, self and politics in a variety of ways, and many sociologists were well aware of the bridges between their emerging field and literary discourses and critical debates in philosophy and psychology, in particular the theories about knowledge, history and the self expounded by Henri Bergson, Friedrich Nietzsche and Sigmund Freud, to name only a few outstanding figures.

Despite their familiarity with and appreciation of such related discourses, early sociologists were largely responsible for isolating their emergent discipline from them. To varying degrees, they built barriers around their own work. Different explications can be advanced to explain why this was done: in epistemological terms, to fend off strong doubts about the feasibility of social science; in political terms, to focus on a possible restructuring of the polities rather than to open possible paths towards less desirable political outcomes of the ongoing social transformations; and in institutional terms, to secure a place for the new field in the universities rather than to allow their own thinking to merge with other approaches under broader headings such as philosophy or history.

**Divergence between the two world wars**

As in many other areas of social life in Europe, the First World War marked a major break in the development of sociology. Durkheim died in 1917, Weber in 1920 and Pareto in 1923. Coincidental as these dates are, it is indicative of a broader intellectual shift that, even though these 'founders' continued to be widely quoted after their deaths, their work did not leave a strong imprint on intellectual debates between the two world wars. This fact can partly be interpreted in political terms since the classical sociological reappraisals of the liberal tradition were no longer convincing. Within the larger crisis of the liberal utopia, the manner of understanding society by classical sociological means was seriously called into question. While the classical period had been marked by a broadly parallel development of sociology in Europe and North America, an intellectual divergence between those two regions occurred in the interwar period, and the temporary demise of the sociological project as it was conceived by the founders developed only in Europe.

In Europe, sociological discourse fell to pieces. The deliberations on a theory of action were taken up by highly voluntarist philosophies of action, often referred to as *philosophy of the deed*. What was later to be called *empirical social research* developed a practical orientation towards the use of information on people's opinions and behaviour and often remained on the fringes of or outside academia. These aspects of the 'broken' discourse came to flourish under the fascist and totalitarian regimes. Philosophies of action underpinned the idea of a strong man and the will and power to rejuvenate the nation. Empirical social research was often specifically organized to acquire strategically useful knowledge about the state of the population. But both pieces flourished separately. Taken together they might have formed an empirically supported social theory of collective action that could have been inscribed into a normative theory of democracy.

Elements of such discourse existed in the United States. If the political philosophy of John Dewey is linked to the social theory of George Herbert Mead and the empirical sociology of the Chicago School, there emerges a body of theoretical and empirical knowledge that emphasizes the human ability to create and recreate one's own life individually and collectively. But such pragmatist and interactionist sociology also did not become the dominant approach in the United States; American sociology experienced an intellectual divide similar to the European one, though much less tumultuous.

The hegemony in American sociological research shifted from the Chicago School in the 1920s and 1930s, to the Columbia School in the following decades, to social policy research in the 1960s. This shift reflected the increasing influence of factors external to academia itself. The Chicago School's urban sociology was oriented towards local social problems, defined by the researchers themselves. During the 1940s, Columbia sociology was largely driven by a demand for data by corporate actors, not least radio companies asking for listener's surveys. The Bureau of Applied Social Research at Columbia, created by the Austrian émigré Paul F. Lazarsfeld, brought major institutional and scientific innovation. This institute devoted to commissioned research, or 'administrative research' as Lazarsfeld called it, focused on large-scale surveys to be analysed by increasingly sophisticated statistical means. Social policy research in the 1960s then transposed this research model into the realm of national science with the federal state acting as a powerful research instigator. The

shift of criteria for research design and topics resulting from this move towards commissioned research has also become known as *epistemic drift*.

Sociological theory in the United States, in contrast, developed somewhat on the sidelines of these research shifts. Talcott Parsons became the towering figure in the theoretical 'modernization' of the social sciences. After having tried to re-appropriate the classical European heritage by showing the relevance of those works, Parsons gradually worked these selectively appropriated ideas into a theory of modern societies as systems differentiated into functionally related sub-systems working as an integrated system. He thus claimed to have solved a key problem of sociological theory, namely to be able to deal with entire social formations while at the same time accounting for the rationales of human action.

In the United States, sociological theory and empirical sociological research had become distinct fields in much the same way as it had in Europe. However, in contrast to Europe, where the institutionalization of sociology was very limited, in America, both fields continued to be considered under the umbrella of sociology. It is within this context that some sociologists proposed a new linkage between the two. For example, in the 1950s, Robert Merton called for middle-range theories that were less comprehensive than Parsonian systems theory but compatible with it and capable of being refuted or underpinned by empirical research.

## GLOBALIZATION AND AMERICANIZATION AFTER THE SECOND WORLD WAR

This divergence in the evolution of sociology in Europe vs. the United States formed the backdrop for the discipline's revival after the Second World War under American hegemony. Again, this situation cannot be understood without considering the political context. The failure of Europeans to safeguard democracy could be linked to their lack of knowledge about the structures and problems of their societies. Their own social philosophies had proven to be insufficient, and perhaps sounder knowledge based on empirical sociological research could have helped to recognize social tensions at an earlier stage.

Such had been the vision of American foundations such as the Rockefeller and the Ford foundations, which had provided support for research between the wars. After the Second World War, the latter foundation stepped up its activities, some of which involved émigrés such as Paul Lazarsfeld in establishing a solid infrastructure and receptivity for empirical research in their countries of origin. With the support of UNESCO, raising public awareness of the modern approach to sociology became an objective of global dimensions. The foundation of the International Sociological Association (ISA) in 1949 marked an important step towards this goal, as it became the second worldwide association of sociologists. The IIS continued to exist but had fallen into disrepute at the end of the war owing to the fascist leanings of some of its spokespersons.

A loose but rather widespread consensus about the form and nature of the modern approach to sociology emerged in favour of Robert Merton's synthesis of predominantly quantitative empirical research as developed by Lazarsfeld,

and a Parsonian social theory of societies as functionally interrelated systems. During the 1950s and 1960s, many national sociological communities brought forth their own quantitative methodologists and functionalist theorists. This conception of sociology demonstrated considerable epistemological optimism as to the manner of apprehending the social world and certainty in the well-ordered nature of society. In this respect, it provided a strong conception of sociology that would soon be criticized. At the same time, this new approach made sociology enormously appealing in the wider intellectual environment as well as among political elites.

The attractiveness of sociology had a double effect. First, the discipline was considerably expanded at universities, which in many countries underwent general rapid growth in the same period. Under the theoretical and methodological umbrella described above, there emerged a great number of sub-disciplines dealing with particular aspects of society, such as industrial sociology, sociology of the family, sociology of science and sociology of religion among others. Second, sociology's perceived potential to contribute to solving social problems led to a rapid increase of commissioned research, often directed towards issues of national policymaking.

*Critical theory* has become a term for a type of social philosophy broadly inspired by German idealism and which rejects empiricism because it accepts the appearances of the actual world as a totality without considering the possibility of a wider realm. While this is a valid argument, critical theorists appear to have inadvertently accepted the mainstream sociological image as an adequate representation of the 'administered society' of that time. Similarly, structuralism and systems theory are in basic agreement with functionalism about the well-ordered and intelligible nature of society; they merely add the idea of contradictions and tensions within the structure to an otherwise pre-established representation.

After accepting sociology in the Soviet Union soon after the Revolution, the official viewpoint in socialist societies (until the Communist Party congresses of 1956 and 1963) considered sociology a bourgeois ideology that hid the class nature of capitalist societies and explained societal developments less satisfactorily than Marxism-Leninism. Beginning in the late 1950s, however, sociological institutes and departments were created in the USSR, the GDR and other socialist states. In Latin America and elsewhere, sociological work during the 1950s and 1960s was dominated by theories of development as a sub-field of the sociology of modernization. Consequently, the sociological theory and research as developed in the United States had no serious challenger around 1960.

## PLURALIZATION, ACTOR ORIENTATION AND CONSTRUCTIVISM AFTER THE 1960s

The 1960s marked the heyday of the quantitative expansion and social importance of sociology, but it was also a period of major new changes. Given the structures of post-war sociology as described above, these changes appeared in the form of contestations, partly as outright rebellions, against the prevailing intellectual, institutional and political hierarchies. Together they mark the end of any intellectual

hegemony and the gradual emergence of a revised sociological project characterized by plurality and reflexivity. These developments can be grouped into three main categories.

First, the universality of the hegemonic structural-functionalist theories were called into question. Arguably, this was a Western, if not specifically American, approach, which could and should not be directly applied to other societies. Even though the goal of universal knowledge was not necessarily doubted, sociological knowledge had to be placed within the various cultural contexts from which it emerged and to which it applied. Consequently, the cultural and intellectual diversity of the sociological project was underlined, even in some parts of Europe, where it originated.

Secondly, a related criticism was directed against the emphasis on *order and systemic reproduction* in the dominant school of sociology. Initially, this debate involved what was then called consensus and conflict-oriented approaches to sociological theory. By the late 1960s, some sociologists argued that growing unrest in society would prove the failure of functionalist theory and prefigure a crisis in sociology (Alvin W. Gouldner, Franco Ferrarotti). During the 1970s, a number of alternative approaches were developed, the most important of which focused on: communicative interaction instead of systemic regulation (Jürgen Habermas); structuration in action instead of structural constraint (Anthony Giddens); logics of practice instead of structural models (Pierre Bourdieu); and social movements instead of societies (Alain Touraine). In sum, they argued in favour of a renewed emphasis on action and communication instead of structure and function in sociology.

Thirdly, there emerged a questioning of any a priori assumption on the superiority of sociological knowledge over 'lay' knowledge. From the argument that human beings construct the social world through interaction, it followed that sociological knowledge is also a social construction, created by reflexively drawing on 'everyday' knowledge that social actors themselves possess. A similar epistemological stand on reflexivity or on the inevitable 'double hermeneutics' can be found in all the major theoretical statements of the 1970s and 1980s. Exerting hardly any strong direct influence until recently, the philosophy of sociology went hand in hand with the 'strong programme' in the sociology of scientific knowledge, which called for 'symmetry' in the study of science and other social practices, and the 'linguistic turn' in philosophy, which emphasized the analysis of philosophy and science as language games that were not a priori distinct from other social languages.

### The end of 'the social' and sociology

At the end of the twentieth century, this period of contestation seemed to have come to an end. The demands of the challengers have not generally been accepted. Much empirical work in the disciplinary sub-fields proceeded as previously. Policy-orientated sociological research continued to be commissioned, though the withdrawal of the state from a strongly interventionist self-understanding reduced the demand for such social knowledge. In theoretical sociology, new perspectives were added to the existing set of approaches rather than replacing them. Some advocates of the more conventional approaches remain unconvinced of the criticisms, whereas others accept at least some of them,

but argue that any important conclusions drawn from them would incapacitate sociology's ability to conduct societal diagnosis.

Nevertheless the overall consequence of the critical approaches has been to increase legitimate doubts about the very possibility of representing society by any straightforward sociological means. This fact accounts in part for sociology's having lost much of its intellectual appeal of the 1960s and 1970s. The understanding of human sociality and the comprehension of society are in danger of getting lost amidst the competing approaches of political philosophy, individualist theorizing and cultural studies. We seem to be witnessing a repetition of the situation that arose at the beginning of the twentieth century when emergent sociology strove for a legitimate intellectual place.

At this point, we must recall sociology's original goal of promoting the comprehensive study of contemporary society. This project resulted from a historical reality: its initial point of reference can be traced to the political revolutions at the turn of the eighteenth century, and it took its 'classical' shape when the nascent societal configurations were transformed into industrial societies and nation-states. The recent emphasis on reflexivity and the linguistic nature of the sociological representations themselves should not be seen as an abdication of that project but rather as a critical scrutiny of the founding assumptions of sociology, i.e., those dating from the period around 1800 as well as those from the classical era at the beginning of the twentieth century.

In such a perspective, analyses of the discourses of the human sciences and of the construction of categories, including key sociological categories, have been put forward. Other works have explicitly focused on the nineteenth-century 'invention of the social' and the construction of the sociological viewpoint (Pierre Manent). Such works, rather than harmful to the sociological enterprise, are absolutely necessary, in particular during periods of major social transformations. Just like the writings on the philosophy and methodology of sociology during the classical period, they are prolegomena to a reconstitution of the sociological project under contemporary conditions of sociality and structures of social relations.

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# 19.6
# ECONOMICS

*Claudio Sardoni*

The period from the mid-1920s to the outbreak of the Second World War was qualified as 'the years of high theory' by British economist George Shackle owing to its tremendous spirit of creativity and innovation. During this period, marginalist methodology was fully articulated by L. Robbins in 1935 emphasizing the positive rather than normative character of economics as a science. In addition, several significant analytical innovations took place. Such was the richness and creativity of the inter-war period that it can be said without exaggeration that almost all themes and issues dealt with by economists during the second half of the century were anticipated during this period. In this chapter, we will examine the developments in a number of fields beginning with the initial significant contributions before the Second World War.

## FROM PERFECT COMPETITION TO OLIGOPOLY

In the mid-1920s, P. Sraffa set out to develop a radical critique of the foundations of the Marshallian theory of value. However, the full implications of this critique were not appreciated until the 1960s. At that time, the profession was more interested in some considerations of Sraffa concerning the kind of markets in which firms are assumed to operate.[1] Sraffa suggested that a realistic analysis of firms' behaviour had to be carried out by considering that they operate in 'imperfectly competitive' markets. Each firm and the goods it produces differ owing to so-called 'imperfections'. In this schema, each individual firm, though small with respect to the size of the industry, is a sort of monopolistic producer and able to influence prices. Many economists took up Sraffa's suggestions and set out to develop the analysis of imperfect competition in a more systematic and formalized way. Harrod, Robinson and Chamberlin were the principal protagonists of the debate on imperfect competition, which shifted analytical attention from the industry as a whole to the individual firm in its process of decision-making. It also brought about an increase in the degree of formalization of economic analysis.

The interest of the profession in the problem of market forms in the 1930s was soon superseded by new concerns. After the war, economists renewed their investigation of this problem, even though attention was now focused on oligopoly rather than imperfect competition. Oligopolistic industries are characterized by the existence of barriers preventing the entry of new firms and by a significant degree of strategic interdependency among the existing firms. One line of research[2] is concerned with the industrial structure and the problem of barriers; others have concentrated on strategic interdependency by using the technique of games theory extensively.[3] A number of economists including Steindl, influenced by Marxism and Kalecki, have argued that oligopolistic industrial economies tend to stagnation as growth and technical progress are hindered by the lack of competition.

## THE MEASUREMENT OF UTILITY AND WELFARE ECONOMICS

Marshall's theory of consumption was based on the hypothesis that utility can be measured in cardinal terms. In the mid-1930s, this hypothesis was abandoned and a new approach to the analysis of consumer behaviour was provided. By drawing on earlier contributions by Edgeworth, Pareto and Slutsky, J. Hicks and R. Allen presented a new theory of consumption, which did not require the measurability of utility in cardinal terms; it suffices that individuals are able to rank different levels of utility in ordinal terms. This hypothesis is sufficient to ensure the existence of a downward sloping demand curve for any good with respect to its price and for any given level of income.

Consumer theory deals with individuals who aim to maximize their welfare; it has, however, implications for the notion of the welfare of the society as a whole. In so far as utility is assumed to be measurable in cardinal terms, the problem of maximizing the social welfare is relatively simple. The sum of individual utilities is the social welfare that must be maximized. Once utility is measurable in ordinal terms, the notion of social welfare becomes less obvious. Pareto,

who had refused the notion of cardinal utility, offered an alternative notion of maximum social welfare: the economy attains this optimum position when, by moving from it, it is impossible to make any single individual better off without making someone else worse off. Pareto also demonstrated the correspondence between the economy's equilibrium and the maximization of welfare.

In the 1930s and 1940s, Pareto's approach was further developed by a number of economists such as Bergson, Hicks, Kaldor, Scitovsky, Lange and Allais. Some introduced a more general definition of Pareto optimality: in order for an optimum position to be realized, it is not necessary that any individual be made worse off; it suffices that those who are made better off have enough resources to compensate those who have lost out. Others dealt with social welfare by using a so-called social welfare function, which, in ordinal terms, specifies the society's preferences. After the Second World War, the consumer theory was further developed by introducing uncertainty in the consideration of consumers' decisions and also by adopting an approach no longer based on indifference curves but on the notion of revealed preferences that avoids concern for the psychological aspects of consumers' decisions.

If Pareto-optimal equilibria are more than one, a problem of social choice arises: the society must decide which configuration it prefers. In democracy such decisions are normally made through voting. However, it has been shown that the majority principle does not guarantee a unique definition of the society's best-preferred outcome. Arrow and Sen have made important contributions in this field by showing rigorously that there is no logical way to arrive at a univocal definition of maximum social welfare.

## PLANNING AND SOCIALISM

Marxism claimed the superiority of socialism over capitalism; the socialist experience in the Soviet Union was seen as an experiment to build a more efficient and just society based on socialist planning rather than on the market. In the 1920s and 1930s, economists like Mises, Hayek and Robbins argued that either a planned economy performs irrationally because of the lack of the market or planning is impossible because of the enormous amount of knowledge and accounting that it requires. Only free markets, through the price mechanism, can ensure the rational and efficient working of the complex system by providing all the necessary information for the optimal use of scarce resources.

Others responded to these criticisms by arguing either that the problems connected to the determination of prices for an optimal allocation of resources could in fact be solved by socialist economies[4] or that the problem of rational allocation is not the crucial concern of planned economies, which mainly deal with the promotion of accumulation and growth.[5]

The difficulties of planning have been the focus of economic theory in socialist countries. In the early phases of the socialist experiment, the main emphasis was placed on planned accumulation and growth. Subsequently, with attempts to reform socialist economies, more attention was paid to the problems of efficient allocation of resources by allowing the market a greater role.

## KEYNES AND THE KEYNESIAN REVOLUTION

All marginalist economists shared the faith in the ability of the economy to ensure the full utilization of all available resources through the free working of the market mechanism. Unemployment could only be a temporary phenomenon due to factors preventing the economy from employing all those who wished to work. Excessively high wages were generally viewed as the typical cause of unemployment. The depression of the 1920s and 1930s showed that market economies could experience mass unemployment without any apparent tendency to recover. In this context, Keynes set out to develop a theory that broke radically with the past tradition (Plate 100).

Keynes's *A Treatise on Money* (1930) marked an initial departure from the dominant paradigm. In this publication, Keynes arrived at original results that gave a foretaste of *The General Theory*. The analytical centre-stage of the book is taken up by saving and investment decisions, which are made by different sets of agents and, hence, may diverge from one another. According to Keynes, it is the divergence between saving and investment, rather than changes in the quantity of money, that makes prices change. If an increase in the economy's propensity to defer consumption is not accompanied by an equal increase in the entrepreneurs' propensity to invest, the economy undergoes a process of economic crisis and falling prices.

After its publication, *A Treatise on Money* was widely criticized, in particular by some of the closest colleagues and disciples of Keynes in Cambridge. These criticisms sparked a period of intense discussion, which eventually led to the publication of Keynes most influential work, *The General Theory of Employment, Interest and Money* in 1936. The group of people who regularly met in Cambridge to discuss the issues related to Keynes's work was known as 'the Circus'. Keynes's principle of effective demand can be expounded as follows. Any increase in employment creates an increase in aggregate output and, hence, in income. The increase in consumption engendered by the increase in income is less than proportional because people normally save a certain share of their income. Therefore, in order for the whole output to be sold, an additional source of demand must be found. This additional demand is the amount of current investment, which is equal to saving, so that the excess of total output of what the community chooses to consume is absorbed. Thus, the equilibrium between aggregate demand and supply crucially depends on investment. The amount of investment depends on what Keynes called the 'inducement to invest', which, in turn, is determined by two factors: the expected profitability of investment and the current rate of interest. Investment is pushed to the point at which the marginal efficiency of capital is equal to the rate of interest. The relationship between the level of aggregate investment and the level of aggregate output and employment was established by Keynes through the use of the multiplier. A change in the level of investment determines a more than proportional change in the level of output. There will be only one level of investment for which aggregate demand is equal to aggregate supply.

This equilibrium level of income cannot be larger than that associated with full employment, but there is no reason

why it should be equal to it. In other words, the economy can find an equilibrium characterized by the existence of unemployment. Unemployment results every time firms as a whole invest less than it is necessary to justify the employment of all those who wish to work at the current wage rate.

The two crucial factors that determine investment – the marginal efficiency of capital and the rate of interest – are both essentially affected by the fundamentally uncertain environment in which the economy works. For Keynes, the uncertainty of the economic and social system cannot be dealt with by using the traditional tools of the theory of probability.

In this context, according to Keynes, present decisions concerning the future are based on conventions based on 'flimsy' foundations and, hence, subject to 'sudden and violent changes'. Thus, investment – a decision made in the present and concerning events to take place in a relatively distant future – gives rise to fluctuations in the aggregate levels of output and employment. The rate of interest depends on the supply of and the demand for money. In Keynes's world, money is not simply demanded as a means of circulation but also as a store of value. To demand money as a store of value is a form of defence against the uncertain future when people come to distrust the conventions on which they rely to make decisions. Thus, with a given quantity of money, the higher the desire to hold money the higher the rate of interest and, hence, the lower the level of investment.

Within this context, according to Keynes, it was very likely that the entrepreneurs' propensity to invest and the public's preference for liquidity worked to keep the economy in a state of chronic unemployment. This was a radical break with the past. As a direct consequence of Keynes's departure from the then prevailing paradigm, came the conviction that the economy could be brought to full employment only through an external intervention in the form of government measures to raise the economy's propensity to spend. Keynes, however, did not contemplate the creation of some form of socialist economy. He repeatedly underlined his aversion to socialism and his desire to reform rather than revolutionize the existent system.

Around the same time, other economists representing other theoretical traditions obtained results somewhat similar to Keynes's. Of particular importance in this respect are the contributions of certain Swedes and of the Polish economist M. Kalecki. The Swedish school of economics developed from Wicksell, who had already determined a shift toward aggregate demand and supply and the effects of monetary changes on the real sector of the economy. The younger generation took up this aspect of Wicksell's theory and developed a new approach to economics characterized by its concern for the study of output as a whole and by the emphasis on the role of expectations in the economic process. In this respect, Myrdal's *Monetary Equilibrium* (published in Swedish in 1931 and in English in 1939) is particularly relevant.

Keynes's essential conclusion that the spontaneous working of the economy may well give rise to chronic unemployment was also reached independently, more or less in the same years, by M. Kalecki, who was influenced by Marxist economics rather than Marshallian theory. Kalecki showed that investment is the prime factor in the dynamics of the economy, and it may remain below the level that ensures full employment. Furthermore, Kalecki explicitly abandoned the assumption of perfect competition and carried out his analysis within an oligopolistic environment.

## THE ERA OF KEYNESIANISM

From the end of the Second World War to the early 1970s, Keynesian macroeconomics was the dominant paradigm in most universities and research centres of the Western world. In addition, the policies adopted by many European and North American governments were largely inspired by Keynesian macroeconomics. However, post-war macroeconomics did not directly reflect Keynes's original theory. Rather, it was a sort of compromise between a pre-Keynesian vision of the working of the economy at the micro level and the acknowledgment of the existence of aggregate unemployment, which could be reduced through 'Keynesian recipes' – a version of Keynesianism called neoclassical synthesis.

In 1937, Hicks had written an article with the intention of presenting Keynes's theory in a synthetic way and contrasting it with the classical doctrine.[6] The thrust of Hicks's interpretation was that Keynes's theory was not so general as it claimed to be but, rather, a particular case of the classical theory. Unemployment depended on special factors and, in particular, on the rigidity of money wages. Although Keynes regarded his theory as a general alternative to the classics and pointed out that unemployment did not depend on wage rigidity, he did not strongly oppose Hicks's version of his theory and, in a few years, the latter became the standard representation of Keynes's macroeconomics under the name of IS-LM model.

IS-LM models are a sort of general equilibrium model in which the interdependency between the goods and the money sectors of the economy are analyzed. These models are largely used to study the effects of monetary and fiscal policies. Samuelson, Modigliani and Tobin have provided important contributions to the development of this version of Keynesianism. The application of Keynesianism to real economies required a vast and rather detailed empirical knowledge to implement and test effective fiscal and monetary policies. This also favoured the development of national accounting and the construction of large econometric models. The management of war economies had already given impetus to the development of modern national accounting with the pioneering work of Meade and Stone. The first large econometric models were mostly elaborated in the United States with the important contribution of L. Klein.[7] Already in the 1930s, J. Tinbergen had significantly contributed to the development of econometrics.

The neoclassical synthesis was affected by a number of theoretical weaknesses, among which its uneasiness to deal satisfactorily with inflation and the largely unexplained gap between the assumed optimizing behaviour of individuals and the non-optimal results achieved by the economy as a whole. These weaknesses became, in due time, the factors that have contributed to the demise of the neoclassical synthesis.

# UNEMPLOYMENT AND INFLATION

In the early 1970s, inflation became a very pressing world problem but dominant macroeconomics could not provide a satisfactory explanation for this phenomenon. Inflation was regarded as typical of economies in full employment, whereas the real world was affected simultaneously by high inflation and unemployment.

An attempt to give a more satisfactory explanation of inflation was based on the work of A. W. Phillips, who had established a functional relation between the rate of unemployment and the rate of growth of money wages. As unemployment decreases, the money wage rate tends to rise, but it remains stable only at a certain rate of unemployment. The neoclassical synthesis used Phillips's results to explain inflation by establishing a direct relation between the rise in money wages and the rise in the general price level (even though wages were assumed to grow more slowly) so that more employment was associated with lower real wages.

In the scenario based on the Phillips curve, workers are constantly 'cheated'. Higher money wages are only an 'illusion' because the higher inflation makes real wage rate fall. Friedman objected that, in reality, workers care for their real rather than the money wage rate and, therefore, in bargaining they take account of inflation, though imperfectly.

Friedman's alternative scenario went as follows. Let us assume that, initially, inflation is zero at a certain rate of inflation and that the government increases aggregate demand through a monetary policy to reduce unemployment. As a consequence, firms set higher prices and are ready to pay higher money wages to hire the available work force. Because workers do not anticipate inflation correctly, they think that their real wage rate has risen; the supply of labour increases and employment increases. However, when workers realize that their real wage has actually decreased, they demand higher money wages and this makes both prices and unemployment increase. This process comes to an end when workers do not expect any inflation and, hence, do not demand higher wages. There is only one point at which zero inflation can be rationally expected: the point associated with the initial rate of unemployment. Thus, in the long period, despite the government's attempts, the economy returns to this rate of unemployment that Friedman called 'natural rate of unemployment'. The economy, however, now experiences a higher rate of inflation.

The policy implications of Friedman's analysis were momentous: the government cannot permanently affect the behaviour of the economy by modifying the level of unemployment. The government can reduce unemployment only temporarily during the period in which workers learn to fully anticipate inflation.

# FROM MONETARISM TO NEW CLASSICAL MACROECONOMICS

Friedman's criticism of the Phillips curve and the explanation of inflation were part of a more general critique of Keynesianism, which he had been developing since the 1950s.[8] Friedman is the best-known representative of modern monetarism. Drawing on the pre-Keynesian quantity theory of money, contemporary monetarists, while criticizing Keynesians for having paid little attention to money, have argued in favour of the neutrality of money: in the long term, changes in the quantity of money affect only the general price level. The monetarist interpretation of the Phillips curve is an illustration of such neutrality. This approach has been also applied to the theory of the balance of payments and the determination of exchange rates. Both the balance of payments and the exchange rates are interpreted as monetary phenomena explained by the demand for and the supply of money.

Monetarism marked a return to pre-Keynesian economics, a process which has been fully accomplished by the so-called new classical macroeconomics, whose major representatives are R. E. Lucas Jr. and T. Sargent. New classical macroeconomists are all characterized by their adoption of the hypothesis of rational expectations, initially introduced by J. Muth in microeconomics, according to which agents behave in a fully rational way and, in forming their expectations, correctly use all available information. This hypothesis underlies the new classical critique of the Phillips curve.

In the monetarist interpretation, workers, though taking inflation into account, do not anticipate it correctly, which explains why expansionary monetary policies have positive temporary effects on unemployment. For new classical macroeconomics, workers anticipate inflation correctly, so that the economy immediately reaches a higher level of inflation with unemployment remaining at its natural rate. The new classical policy implications are even stronger than the monetarist: government interventions cannot even temporarily alter real variables and, therefore, they are negative or useless.

The neoclassical synthesis put together Keynesian macroeconomics and the marginalist approach to microeconomics. Thus, at the micro level, agents were postulated to be rational and optimizing, and markets were to operate in a way that ensured equilibrium through changes in prices. But, if individuals act rationally and optimize their objectives, how is it possible that the system does not achieve optimal results as well? This difficulty was partly overcome by introducing obstacles that prevented the economy as a whole from realizing optimal results. Wage rigidities were regarded as the factor that caused unemployment; if wages were flexible, the labour market would always be in equilibrium with unemployment. New classical macroeconomics refused any hypothesis of rigidity and assumed that all markets are continuously in equilibrium. Deviations of the economy from its 'natural position' can only derive from random shocks, which, in turn, are caused by changes in policy that agents may fail to anticipate immediately because taken by surprise. Along these lines, an 'equilibrium business cycle theory' has been developed.[9]

New classical macroeconomics has also exerted a strong influence on econometrics with its critique of Keynesian econometric models. Lucas pointed out that those models could not provide good forecasts of the effects of policy because of their inability to take account of how agents modify their behaviour in consequence of the policy measures themselves.

Recently, a group of economists, usually called new Keynesians, have criticized new classical macroeconomics for the unrealism of some of their assumptions and policy indications. New Keynesians argue that actual economies

are in fact affected by problems such as persistent unemployment, which cannot be explained and cured by new classical macroeconomics. New Keynesians take the new classical analytical framework as their starting point and try to obtain 'Keynesian results' by introducing additional hypotheses into that context. Such hypotheses involve market imperfections and imperfect knowledge and information. In contrast with the adherents of neoclassical synthesis, new Keynesians try to explain these imperfections through microeconomic analysis. Many new Keynesians have focused their attention on the working of the labour market in searching for an explanation for the rigidity of wages; others have concentrated on financial markets characterized by imperfect information.[10]

## GENERAL ECONOMIC EQUILIBRIUM AND THE FORMALIZATION OF ECONOMICS

Walras had published his most important work, *Elements of Pure Economics*, in the 1870s, but his approach to economics, based on the idea of general economic equilibrium, did not gain a wide acceptance at that time. It was not until the 1930s, that significant advances towards the modern formalization of the model of general equilibrium were made in continental Europe.[11] After the First World War, this approach was revived. Arrow and Debreu provided a rigorous demonstration of the existence of a general equilibrium position for an economy in which agents operate in perfectly competitive markets. Others, such as Hicks and Samuelson, concentrated on the problem of the stability of general equilibrium. Another important contribution in the field of general equilibrium economics was made by Arrow and Hahn.

A refined version of the general equilibrium approach has become standard and almost universally accepted by the profession. The highly formalized nature of this approach has naturally led to a growing use of mathematics in economics. But the progressive formalization is not a phenomenon confined to the study of general equilibrium. All fields of economic research have experienced an increasing use of advanced mathematical techniques. Although the advent and dominance of marginalism had already marked a significant increase in the degree of formalization of economics with respect to classical political economy, it was after the Second World War that formalization gained momentum in economics.

## ALTERNATIVE SCHOOLS OF ECONOMICS

The neoclassical synthesis, monetarism and new classical macroeconomics have largely dominated economics at different periods but not without opposition. A number of economists, known as post-Keynesians, have strongly opposed mainstream economics and proposed an alternative approach more closely related to Keynes's own ideas and, sometimes, to Kalecki's work. Among the founders of the post-Keynesian school were some economists closest to Keynes, such as J. Robinson, R. Kahn, N. Kaldor. The emphasis on the inherent instability of the economy and its tendency towards chronic unemployment are essential

characteristics of this school of thought. Other outstanding figures among the post-Keynesians are Weintraub, Minsky, Davidson, Pasinetti and Harcourt.

Since the 1960s, some post-Keynesians have joined forces with another group of economists, led by Sraffa, in their critique of the dominant paradigm. Sraffa's research concentrated on two connected fields of research: the critical edition (with Dobb) of Ricardo's works and his own book entitled *Production of Commodities by Means of Commodities* (1960). In his book, Sraffa solved some problems of the theory of value of classical political economy and offered an alternative to marginalism based on an approach focusing on the conditions under which the economy is able to give rise to a process of reproduction and growth rather than on individuals' choices in the allocation of scarce resources. Inspired by Sraffa, Robinson, Pasinetti, Garegnani, Harcourt and others criticized the marginalist theory of distribution based on the use of aggregate production functions and, in particular, the notion of aggregate capital, which was regarded as a logically flawed concept. The critique provoked a wide debate with Samuelson and Solow, the main defenders of the marginalist camp.

Among the other non-orthodox schools in economics, the two oldest are institutionalist and Marxist economics. Founded by T. Veblen, W. Mitchell and R. Common, institutionalism is characterized by its more empirical and historical approach to economics and by the important role played by institutions in the economic process. Modern institutionalism, while maintaining its focus on the role of institutions, also adopts a more formalized and analytical approach. R. Coase, J. Galbraith and G. Myrdal are generally regarded as institutionalist economists. While developing Marx's critique of capitalism, modern Marxist economics has largely concentrated on the problems of the Third World, which we consider in the next section.

## GROWTH AND DEVELOPMENT

Classical political economics of the nineteenth century had been mainly concerned with the problems of accumulation and economic growth. Marginalist economics, with its insistence on the notion of scarcity, paid very little attention to growth. The most significant exception was J. Schumpeter, who, in this respect, was closer to classical thinking and Marx. In Schumpeter's view,[12] capitalist economies undergo a process of cyclical growth driven by innovative entrepreneurs who introduce new methods of production in view of higher profits.

Schumpeter did not acquire a dominant position in the profession. A new interest in growth pioneered by R. F. Harrod followed the Keynesian revolution. By using some basic elements of Keynesian theory, he studied the conditions for a balanced process of growth and showed the extreme instability of such a process: if the economy deviates from its equilibrium path, there are no re-equilibrating forces at work. Domar achieved similar results working independently of Harrod. Other important contributions to the modern theory of growth came from Robinson, Kaldor and Solow.

Harrod was not concerned with income distribution; Kaldor introduced this topic in a model of growth[13] and started a wide debate on the relationship between growth and distribution, which brought in the debate on capital

theory. Pasinetti improved Kaldor's contribution and analyzed the functional relation between aggregate investment and profits.

Post-Keynesian models of economic growth, with some exceptions[14] are generally aggregate models. In the post-war period, by drawing on Leontief's analysis of inter-industrial flows of goods and services[15] and on von Neumann's model of general equilibrium many multi-sectoral models of economic growth have been built. In their 1964 publication, *The Theory of Economic Growth*, Hahn and Matthews provide a useful survey of the literature on economic growth up to the early 1960s.

In more recent years, the problem of growth has been mainly treated by the use of the so-called models of endogenous growth. In this approach, many important factors promoting economic growth, such as technical progress and education, are considered to be dependent upon the rate of growth – an old idea found in the works of Smith and, more recently, Kaldor. In addition, Romer and Lucas have presented well-known models of endogenous growth.

The concern for growth in the post-war period was also revived by the practical problems raised by the economies of many of the newly independent countries. For these countries at an early stage of development, the theories and policies developed in the more industrialized Western countries did not prove to be viable and immediately adaptable to their needs. Thus the autonomous branch of development economics emerged with the aim of providing an original approach to the problems of countries starting their process of growth almost two centuries after the Industrial Revolution in Europe.

In the early phase, the prevailing conviction was that developing countries could not possibly start a process of growth without significant external interventions and state and foreign aid. The state should provide the incentives for investment and production that the domestic and international markets could not produce spontaneously. In less-developed economies, growth was not hindered by labour scarcities; more serious obstacles were the scarcity of capital and aid from developed countries. State intervention was generally seen as aiming to engender a process of balanced growth, which could effectively exploit all the benefits of inter-industrial complementarities. An exception was Hirschman's position, which advocated unbalanced growth by favouring the more dynamic sectors of the economy, which, in turn, would promote and drive a more general process of development.

The persistence and, sometimes, the widening of the gap between developed and less-developed countries also produced rather pessimistic views about development. One of the factors, which, for many, prevented or delayed development, was the existence of unfavourable terms of trade between industrialized and developing countries. Structural differences produce a tendency for the prices of manufactured goods to remain higher than the prices of agricultural goods, so that developing countries' indispensable imports for growth are increasingly more expensive. But the existence of structural differences has not been invoked to explain terms of trade only. Several economists have elaborated analyses that explain the lack of development by the existence of a number of inflexible structural features affecting less-developed economies.[16]

Marxist and radical economists have paid much attention to developing countries. A basic feature of the Marxist approach has been the idea that the lack of development is a consequence of development itself. Industrial capitalist countries derive, to a large extent, their richness from the exploitation of poorer countries through international trade or from the availability of low-paid labour.[17]

In recent years, development economics has tended to be re-absorbed into economics in general, so that development is treated with the standard tools of the discipline, and the solution for the problems of less-developed countries are seen exclusively as policy problems. Unlike earlier economists, most specialists today advocate a declining role for the state and more reliability on the virtues of free markets. Largely as a reaction to these tendencies, others concerned with development have reacted by claiming that economics on its own is insufficient to cope with the problem of development, which requires a much wider perspective taking account of historical, social and cultural aspects.

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# 19.7

## LEGAL SCIENCES

*Nicola Lacey*

At the end of the twentieth century, any review of the development of the legal sciences had to confront a number of challenges. Some of the most influential debates in social theory that have developed during the latter part of the century have questioned the very idea of law as a 'science': that is, as a discipline generating objectively validated knowledge or truth. More specifically, legal sciences are distinguished from most of the other disciplines addressed in this chapter by their connection with a distinct set of professional institutions and practices. Indeed, this connection and its consequences for the status of law as a discipline are unique among the ten disciplines explored in this chapter.

In considering the development of legal sciences, one is therefore confronted with at least two conceptions: the development of the legal sciences or legal theory; and practical 'legal science' a subject of study under the intellectual disciplines of law and legal pedagogy. In this review, we shall concentrate on the development of legal scholarship during the twentieth century, but any such enterprise must also deal with the relationship between developments in legal science and the fields of legal education and legal practice.

At the beginning of the twentieth century, law was already well established as a discipline in universities in most parts of the world. The academic institutionalization of law reflected the distinctive importance of law as a tool of governance in modern societies. Of course, the specific articulation of the relationship between law and the nation state varied enormously throughout the world. In the more secular Western societies, law was regarded as relatively separate from politics, playing a special role in negotiating the relationship between citizen and polity. In more traditional societies, the relationship between law and religious and political institutions is more intimate, and in the emerging socialist world, law is regarded as an explicit tool of state ideology. The modern Western ideal of the rule of law, and its associated conception of the separation of legislative, executive, and judicial powers had an enormous global significance as it was exported via colonization and incorporated into the emerging international legal order represented by the League of Nations and, subsequently,

the United Nations. During the first half of the twentieth century, the pre-eminent position of modern, relatively autonomous systems of law created the context within which the intellectual study of law would flourish and expand across the globe.

It should be noted that the world of legal scholarship, and hence the intellectual field of legal science, has never been confined to law schools. The study of rhetoric, theology, history and philosophy, for example, has always been associated with the study of law. With the development of the social sciences in the early part of the twentieth century, law also became a field of study within the newer disciplines of sociology, anthropology, political science and political economy. During the twentieth century, this link between law and the latter disciplines has brought about a re-evaluation of the study of law. No longer considered one of the humanities, law was regarded either as sub-discipline of social sciences or as a distinct field in its own right (this latter view being advocated by legal professionals). However, the appropriation of law by the social sciences has hardly been complete, and at the end of the century there were signs of a revival of the conception of law as belonging to the humanities. This recent tendency results in part from the injection of various European philosophical traditions within debates on the nature of law.

The general tendency in the twentieth century towards fragmentation and a blurring of the boundaries between the disciplines found particularly fertile ground in the legal establishment. In legal theory, as we shall see, this disciplinary context has generated successive attempts to delineate and conceptualize the specificity of legal reasoning and legal institutions. During the twentieth century, the uneasy relationship between the academic study of law and vocational legal training both supported and threatened the emergence of law as an autonomous intellectual discipline. The status of law as a distinct discipline has been rendered even more problematic by institutional changes in the forms, variety and location of legal practices. Legal sciences' greatest claims to specificity derive from the practical existence of laws: legal sciences are concerned with the study of a specific set of social practices. During the twentieth century, the fragility of law's status at the disciplinary level was

accompanied by significant changes at the institutional level, which have fragmented the practice of law and have generated numerous institutional changes.

At the practical level, the growth of state functions and the expanding sphere of legal regulation in the industrial and post-industrial countries blurred the distinctions between public and private spheres but also between legal and political governance. As law developed as a primary tool for the realization of government policy, the distinction between policy and law began to blur, thus raising crucial questions about the integrity of legal interpretation and the independence of the judicial function. At the same time, the diversification of legal regulation took law well beyond its traditional institutional framework, generating myriad new institutions with a mixture of juridical, administrative and therapeutic functions.

This expansion and diversification of the legal realm within the nation state was matched by the proliferation of non-state legal orders, which, with the increasing influence of sociology and anthropology on legal theory, finally began to claim the attention of legal science. The early impetus for this attention was probably provided by debate surrounding the relationship between indigenous and imperial legal systems in colonized countries. But the insights generated by scholars in developing countries, accelerated by the growing fields of anthropology and the sociology of law, have been increasingly prominent in the advanced economies. This has generated a vision of multiple, co-existing legal systems within and across the boundaries of particular territories, complicating the strong modern association of law with the nation state, and posing, in new wording, old questions about the relationship between law and other normative systems such as ethics, politics and religion. Moreover, the development of a variety of technologies – electronic communications, air travel – as well as the internationalization of markets, during the course of the century, has generated new legal phenomena, which are no longer compatible with traditional ideas of law as exclusively the product of the nation state. International and transnational legal orders are gradually developing with a variety of institutional frameworks more or less closely articulated with nation states. Not only the system of public international law but also regional structures such as the European Union and private frameworks such as the commercial *lex mercatoria* are posing new questions, which legal sciences are struggling to accommodate.

Four main theoretical approaches to law – each of which generates a different conception of legal science and a distinctive approach to the foundation of legal authority – emerged during the course of the twentieth century. The first is the doctrine of *legal positivism*. Positivism conceptualizes law as the product of human decision: as a distinctively institutionalized system of power, whose content is entirely determined by the legislative acts of political authorities. This engenders an essentially formal approach to the validity of laws: the validity and hence existence of any law is to be understood in terms of its pedigree and mode of enactment. In the Western world, legal positivism was undoubtedly the pre-eminent way of understanding law at the turn of the twentieth century, and this understanding is intimately related to the modern conception of legal science. The legal scientist is in command of the technical skills required for the identification and analysis of laws and is not concerned with the ethical or

political analysis of those laws but rather with the exercise of legal rationality. The positivist tradition engenders a primary focus on dogmatic and doctrinal analysis: on the complete, accurate ('scientific') and systematic description of the contents of particular legal orders; on scientific knowledge of particular legal systems and areas of legal regulation such as commercial law, the law of contracts and criminal law. The notion of autonomous legal science and its accompanying academic institutions therefore find their most perfect expression in the concept of positivism.

In spite of its pre-eminence in the Western world in the early twentieth century, the positivist conception of law and legal science has had by no means been the only approach. In particular, the continuing importance of the ancient tradition of *natural law* cannot be discounted. This naturalist tradition, and its numerous variants, views the sources of law's authority and validity as lying within extra-legal norms that derive from ethical or religious doctrines. During the eighteenth and nineteenth centuries, the increasing secularization of nation states led to a decline of the naturalist tradition in the Western world. Yet it may be argued that the modern conception of human rights, institutionalized across the globe in diverse national and international declarations and charters, constitutes a distinctive expression of the naturalist sentiment. Furthermore, even within secular polities, the latter part of the twentieth century witnessed an important revival of natural law thinking. This may have been in part a response to a crisis in the authority and perceived legitimacy of nation states and in particular to the abuse of state law by totalitarian regimes such as that of the National Socialist government in Germany in the 1930s and 1940s. It was vividly expressed, for example, in the concept of crimes against humanity retrospectively applied at the Nuremberg War Crimes Tribunal after the Second World War (Plate 101). On an intellectual level, the revival of the concept of natural law is related to the difficulties encountered by legal positivism in providing adequate justification for the foundations of legal authority. If, as positivism implies, law is simply the institutionalization of power, how can the authority of law and its claim to its subjects' allegiance and obedience be explained? The central problem, therefore, involves the very autonomy of the positivist conceptions of law: if law's authority and, hence, validity, can only be understood in terms of its relation to extra-legal norms, how can the continuing relevance and influence of those extra-legal standards (i.e. ethical or religious) be excluded from the interpretation and administration of law and from the study of these practices? It follows that the naturalist tradition advocates a broader conception of the realm of legal sciences than the positivist tradition, which focuses not only on the intricacies of legal doctrine and legal reasoning but also on the underlying principles informing and legitimating particular areas of law. The naturalist tradition regards legal science as markedly less distinct from the disciplines of ethics and political theory than does its positivist counterpart.

For proponents of natural law, there is no clear division between valid law and extra-legal norms: law is identified in terms of its compatibility with ethical standards, and there is no clear distinction between what law is and what law ought to be. While the term 'natural law' is associated with a tradition reaching back to Aristotle and developed by Catholic theologians such as St Thomas Aquinas, the broad

framework of natural law thought can encompass any system of legal science in which the question of legal validity is inextricable from questions of ethical, religious or other authority. Consequently, Islamic systems, now in place in many regions of the world, and which view legal, political and religious authority as intertwined, may be regarded as expressing a version of the naturalist approach. In such systems, the idea of law as an independent science is evidently less prevalent than in Western societies. Furthermore, in state socialist societies, the explicit realization of a particular ideology in legal terms might also be seen in terms of a natural law approach. Even in liberal democracies, the continuing power of the appeal to the role of law in upholding democracy and human rights might also be seen as consistent with the natural law tradition. Indeed, one of the central claims of critical legal theory (see below) has been that the positivist outlook is itself ideological, in that it conceals the problematic foundations of legal authority by representing political decisions as scientific truths, and by subtly representing the political dominance of a particular conception of law as the result of a historical process of evolution towards an ideal type.

The positivist conception of autonomous, technical legal science has always had to contend with powerful criticism from the naturalist tradition. In the twentieth century, however, it was also challenged by the phenomenal development of the social sciences, and hence with a third conception of *legal science as a social science*. In some senses the positivist conception of legal science has been a victim of its own success. As law's role as the pre-eminent tool of governance expanded with the broadening functions of the nation state, law itself was subject to the increasing influence of both politics and economics. If law was being used as a means to implement policy and economic regulation, law as a discipline appeared to be increasingly formal, a void to be filled by the imperatives of economic and political power. In several Western societies, the predominant pedagogic practices of conceptual and doctrinal analysis began to be challenged by sociological approaches. Instead of accepting legal forms and institutions as a given, sociological techniques were used to approach law as a social practice to be analysed in extra-legal scientific terms. Questions began to be asked about law's social, economic and political functions, the institutional, cultural and economic conditions of its existence, its varying forms and the significance of these variations, and the patterns of law creation, interpretation and enforcement through a variety of agencies extending well beyond the orthodox terrain of legislatures and courts. With the birth of the sociology of law came an increased emphasis on comparative legal studies, in which legal systems became the subject of comparative political, sociological and cultural analysis in much the same way political systems had been studied within the field of political science. In addition, a noteworthy 'realist' movement in legal theory developed. This movement was distinguished by its scepticism towards the substantive significance of legal doctrines and by the fact that it focused not on law's articulated standards but rather on its concrete effects and their underlying political causes.

In various fields, there was a prevailing tendency to reduce the specificity of law and legal rationality and to claim that legal phenomena and reasoning could be explained scientifically in terms of the tools used by social scientists. Perhaps not surprisingly, such ideas were relatively slow to infuse mainstream legal education and the legal establishment. Indeed, they attained a status roughly equal to that of doctrinal analysis only in a few parts of the world – notably North America – and only late in the century. This situation can be explained by the tension within the legal establishment between legal science as the study of legal phenomena and as practical knowledge with which law students should be inculcated. It is important to note that sociological approaches to law have also grappled with the question of the specific nature and autonomy of law. This fact is perhaps best exemplified by the idea of law as an 'autopoetic' or self-referential sub-system in a social world composed of many such systems – an approach that became influential in European legal theory in the late twentieth century.

Towards the end of the century, the manner of confronting legal science was further fragmented by the development of a fourth, heterogeneous family of approaches to legal theory. These *'critical' approaches* blend insights from the humanities and the social sciences. Examples include the development of feminist legal theories, critical race theories, post-colonial theories of law, and psychoanalytic and deconstructionist critical legal theory. As in the social sciences, these approaches – which derive in part from the development of new social movements such as feminist and anti-racist movements, but which also have important roots in Marxist and socialist thought – analyse law in terms of standards and influences outside law. They deal not only with legal rules, doctrines and institutions but also with the specific effects of institutions and laws. However, they differ significantly from standard social scientific approaches such as the sociology of law. To begin with, as they are more inclined to take the rational nature of law seriously, they tend to focus on the intricacies of legal doctrine, while exploring what doctrinal frameworks may systematically conceal, as well as the historical context of particular doctrinal frameworks. Secondly, they participate in an emerging scepticism about the very idea of objective scientific knowledge, emphasizing instead the way in which theories of law, and legal arguments themselves, are constructed from particular points of view.

To a greater extent than in the social sciences, these critical approaches have joined forces with humanistic practices such as analysing law as discourse or rhetoric, and raising epistemological questions about the basis for assertions of legal knowledge or truth. Like the social science approaches to law, however, these critical approaches have been relatively slow to find a broad foothold in the legal establishment. Once again, the explanation has to do with the tension between that establishment as an intellectual space open to ideas, which question its own status, and as a social institution whose existence is premised on the development of a specific discipline.

Each of these four families of legal science finds expression in many parts of the world today. At the dawn of the twenty-first century, it is impossible to identify a dominant conception of the legal sciences. Rather, we see a field which, notwithstanding its particularities, is characterized by both the globalizing influences and the gradual erosion of disciplinary boundaries, which has also affected other branches of social sciences.

Today, as at the outset of the twentieth century, law is one of the most important of the sciences of governance. In its future development, the tension between the imperatives

of the reproduction of professional legal castes and the increasingly interdisciplinary tendencies in the humanities and social sciences will undoubtedly create an increasingly fragmented, yet vibrant, discipline whose hybrid nature is unlikely to substantially undermine its institutional power.

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# 19.8

## POLITICAL SCIENCE

*Björn Wittrock*

## INTRODUCTION: POLITICAL SCIENCE IN HISTORICAL PERSPECTIVE

Perhaps more than any other social science discipline, political science involves the study of problems that may appear to be timeless. Political thinking and philosophy are not limited to concerns of the contemporary era or of the last two hundred years; rather, they tend to deal with – or so we are led to believe – basic concerns inherent in any community forced to face major decisions regarding the means to attain the common good, the rulers to be chosen and the type of rule to be exercised. It is therefore easy to understand why proponents of the discipline so often invoke an Aristotelian notion of a science of politics as 'a master-science'.

The social science disciplines, as we know them today, were institutionalized in the late nineteenth and early twentieth centuries and shaped by the political, intellectual and institutional contexts. The new social sciences were forms of reflection on the broad societal processes of modernization and differentiation of working and everyday life that fundamentally transformed nineteenth-century societies in Europe and North America from rural, agrarian and localized into increasingly industrial, urban and nation state centred. These transformations, the coming of 'modernity', deeply affected discourses not only on 'the social question', i.e. the accommodation of the more or less uprooted masses of modern industrial society, but also on the creation of cultural and national identity and on the modern nation state that were to serve as vehicles for these processes.

The intellectual projects drafted to foster a better understanding of the role of state and politics in this new societal constellation varied greatly across nations. Sometimes they took the form of intellectual inquiry into those processes of state- and institution-building that were such a prominent part of the nineteenth-century societal strivings and beliefs. In some cases – as in the analyses by Andrews, Furner, Haskell, Ross, Silva and Slaughter, or Manicas – the professionalization of political scientists is seen as an effort among former elites to prepare for reforms designed to preserve the traditional aspects of the discipline

from the onslaught of modernity. In other cases, the emergence of young nation states meant that the constitution of a new political, administrative and legal order was an urgent item on the public agenda and some form of 'state sciences' was expected to provide some of the answers.

## EVOLUTION AND CONSOLIDATION OF POLITICAL SCIENCE: FOUR TRADITIONS

The different developmental paths of political science throughout history may be understood in terms of four broad intellectual traditions that came to influence the discipline differently across countries and regions.

First, a realm of *historical-philosophical* discourse on politics existed in eighteenth-century Europe and also included discourses on political economy. This historical-philosophical discursive field was clearly the cradle of a discipline of politics in Britain and in a number of its former colonies. A series of scholars have argued that the notion of a science of politics emerged out of the concerns to constrain undue enthusiasm and passion. The key proponents of this new science were moral philosophers and political economists, including thinkers of the late-eighteenth century Scottish Enlightenment.

Hume, Smith, Ferguson, Millar and Stewart all contributed to the outline of an inquiry into constitutions and political institutions conducive to restraint and moderation in governance. Such a mode of inquiry was designed to go beyond the merely descriptively historical and to link historical examples to a scientific understanding of human nature and of the propitious conditions for the emergence of free commerce, markets and trade.

This encompassing project of a historical and moral philosophical discourse on politics and governance may be seen as a continuation of the broad intellectual tradition of the so-called moral sciences. In British discourse on the study of politics, it may even be considered a root metaphor for such discourse. In this perspective, perhaps the 'tragedy of political science' – to borrow Ricci's term – is that it has divested itself of a serious concern for moral argument and

its potential to shed light on crucial issues in order to preserve wisdom and prudence in government. However, the concern for normative theory as well as for institutional and intellectual history that was central to this tradition does not seem to have been weakened but rather 'to have strengthened its influence over time'.[1] Nevertheless, a slow process of professional and technical specialization came to define standards of technical competence that gradually seemed to impede dialogue between the representatives of these disciplines and academics lecturing and studying in the field of politics. However, the renaissance in recent decades, propelled by scholars representing different branches of political science such as intellectual history and normative political philosophy, now makes these fears seem exaggerated. In fact, the broad historical-philosophical tradition, sometimes suspected to be superseded by the achievements of the so-called behavioural revolution of the 1950s and 1960s, now stands out as more vital and important to the future of the discipline than ever before. It is also noticeable that in recent years, the openness within the discipline of political science and outside of it has increased dramatically.

However, 'the tragedy of political science' has another side to it, namely the departure of other discourses from the general realm which had once been shared by students of politics, history, moral philosophy, and political economy. From this perspective, the study of politics is not so much a new discipline of political 'science' but rather something of a secondary discipline, i.e. that which remains of a once-encompassing undertaking after other modes of systematic inquiry have branched off and established themselves as well-entrenched and essentially self-contained modes of analysis.

*Political economy* was the first specialized type of discourse within this broad constellation to distinguish itself intellectually in disciplinary terms. Already in the early nineteenth century, political economy constituted a clearly delimited domain of discourse of its own, although it maintained strong links to history throughout that century. Only much later did corresponding shifts towards technical specialization seriously erode the feasibility of history and philosophy serving as 'the twin pillars' – to use David Held's term – of an academic discourse on politics. Nevertheless, there always existed a practice of reasoning on politics that draws on a tradition of *rationalistic-deductive theorizing*. The renewed dialogue between contemporary economics and rational choice theory, on the one hand, and political science at large, on the other, has often been able to draw on this tradition and to revive it significantly.

A third realm of discourse that deeply affected the emerging discipline of politics and government may be termed *legal-administrative*. The old tradition of the princely states, e.g. Germany, Austria, but also Russia and Scandinavia, of the late eighteenth and early nineteenth centuries to underpin administration and governance by way of an array of so-called police and cameral sciences could perhaps even be considered a precursor to modern policy sciences. It would, however, be a gross simplification to construe anything like a clear continuity in scholarly terms between these early endeavours and the increasing policy orientation in the modern social and political sciences. But in terms of administrative practices, state production of comprehensive statistics, as well as in the establishment of institutions for the training of administrative personnel, there are some lasting influences on the shaping of modern social science disciplines.

Administratively and legally oriented discourse on politics and the state in continental Europe of the late nineteenth century in the tradition of the 'sciences of the state' tended to evolve in an increasingly abstract and generalizing direction. It largely came to focus on the encompassing project of elaborating a coherent legal system that might serve both as a rationale and a guideline for the bureaucratic governance of the new or renewed nation states of Europe. This programme of so-called legal positivism became a central component of the modern version of state sciences, but it also served as a benchmark for critics who strove to expound a theory giving fuller weight to the actual practices and power struggles in interventionist states.

This type of legal-administrative discourse came to exert a powerful influence well beyond continental Europe. Thus it has been argued, particularly by Gunnell, that it also deeply affected early American political science and served as a link between inquiry into empirical and normative issues by way of a hypothesized entity representing an assumed societal consensus beyond the mere operations of a governmental apparatus or the strivings of diverse popular factions. A theory of the state became an intellectual means to fill in the missing link between the idealized entity 'We, the people' of the American Constitution and the bewildering multiplicity of diverse social, ethnic and religious factions making up the population of the vast new country. The legal-administrative tradition also proved critical to the development of political reasoning in Eastern Europe, Latin America and in several Asian countries.

Aside from the purely legally oriented discourse and statistical studies, there was another line of research and practice of major importance for the emerging discipline of political science: the efforts by entrepreneurial individuals to modernize and professionalize the training of administrators while linking it up to a scholarly programme of research. This was essentially the project of Emile Boutmy that led to the establishment of the École libres des sciences politiques in Paris and similar efforts were made, though with considerably less success, in other settings (e.g. in Italy) at roughly the same time. As often is the case with contemporary public administration and public policy schools, many of these efforts were marked by conflict between the demands inherent in the professional training programme and the demands of a scholarly-driven intellectual enterprise, and in such a struggle the latter component easily tends to lose the upper hand.

The school at Columbia, established in 1880 and modelled partly on Boutmy's school, was an exception in its emphasis on scholarship rather than on professional training, despite the fact that it developed under the intellectual leadership of German-trained scholars such as Burgess. In some ways, the whole broad and highly consequential development of schools of public policy and public administration and management draws on this older tradition of political science and constitutes a continuation of this tradition even though it was strongly influence by a more economic-rationalistic (micro-economic) type of reasoning.

In the continental European setting of the first half of the twentieth century, the tradition of the 'state sciences' remained legalistic in its orientation, and after the Second World War it was often perceived as a 'blind alley' by representatives of a more empiricist and behavioural form of political science. It is interesting to note, however, that three broad areas of research, which are crucial today,

advocate a renewal of a type of reasoning that had been of such importance to the older generation of scholars, namely those associated with the constitution of overarching political orders such as the European Union, with the establishment of constitutional foundations in new polities, whether in Eastern Europe or in the Third World, and with the analysis of the nature of international regimes and order. These new fields of research have witnessed a renewed interest in legal-constitutional reasoning, often in fruitful dialogue with rationalistic-deductive and historical-philosophical reasoning, and require once-prominent forms of competence that were neglected to some extent within the discipline of political science during part of the post-Second World War period.

A fourth major intellectual tradition known as the *sociological-behavioural* exerted the greatest influence on the evolution of political science in the twentieth century. Some of its roots may be traced back to the discourse on systematic and societal constraints that emerged in the wake of the French Revolution. However, whereas continental European thinking tended to be systemic and structural, in the American setting it became linked to pragmatist philosophy and an empiricist epistemology giving rise to a new form of behavioural social and political science. It is the breakthrough of this tradition in North America in the interwar period that set the stage for the subsequent so-called *behavioural revolution* in international political science in the decades following the Second World War.

The discipline's key transitional figure is Charles Merriam, who was entirely familiar with the early American tradition of state-centred political science – from Lieber, Burgess and Adams and Willoughby to his teacher Dunning – and also with European scholarship of the same period. In a remarkable way, Merriam represents continuity and innovation, disciplinary demarcation and interdisciplinarity. Merriam is generally heralded as the progenitor of modern empirically oriented political science, at least in the American context, but he is also an advocate of cross-disciplinary collaboration, as were many later behavioural social scientists.

Also facilitating the rapid development of political science in the United States was the fact that the linkage between the different realms of discourse presented above was established much earlier and more successfully than it was in Europe, even though many of the most significant developments within all these realms continued to occur in European universities. In Europe, however, few or no settings existed that could serve as a catalyst for new types of inquiry into political matters, involving research of a mainly behavioural nature, as occurred at the universities of Chicago or Columbia.

Already in 1924, Charles Merriam emphasized the relevance of the new development of behaviourally oriented social and political science and pointed out the importance of public opinion and voting behaviour, political parties and interest groups, and the possibility of an empirical study of these foundations and backgrounds to formally organized government. There were both intradisciplinary and political-societal reasons for the shift towards classificatory inductivism in the study of institutions. Thus it coincided with a strong aversion to strictly formalistic reasoning expounding the rationale of the state in terms of a legal positivistic discourse. The belated and, as it turned out, often ephemeral triumph of parliamentary democracy in

European nations in the wake of the First World War was sometimes perceived as a repudiation of abstract reasoning premised on the assumed existence of an interest and rationale of the state beyond the realm of critical reasoning.

Thus an intellectual rupture occurred in American political science in the interwar years. However, the later US careers of European or European-trained scholars such as Kelsen and Morgenthau bear witness to the fact that parts of the earlier traditions of legal discourse came to exert an indirect and sometimes inadvertent influence also on American political and social science in later decades, albeit an influence largely taken out of the intellectual context in which these modes of theorizing had been shaped.

## EXPANSION AND INTERNATIONALIZATION OF PROFESSIONAL POLITICAL SCIENCE

The modern discipline of political science is to a large extent a post-Second World War phenomenon that occurred both at the international and the national levels.[2] Along with the establishment of the International Political Science Association (IPSA) under the auspices of UNESCO in 1949, there began a gradual process whereby political science came to be introduced or fundamentally redefined in a diversity of national settings, including the Netherlands, Norway and West Germany but also in Latin America, Australia, India and Japan and several other Asian countries. These developments often meant that elements of the sociological-behavioural tradition came to affect research in political science but rarely to such an extent that other earlier traditions were totally marginalized. A process of professionalization was set in motion and came to exert a truly profound worldwide influence in the wake of the expansion of higher education systems in a many countries in the 1960s and early 1970s.

With the spectacular expansion of higher education systems and the parallel processes of administrative reform, political science became firmly entrenched as an academic discipline in the university systems. Moreover, in many countries the rise to power of new political majorities and the launching of major new public policy programmes across the board also fostered this evolution. In the age of great public policy programmes, political science was able to secure a firm basis in a series of European countries, either for the first time (e.g. Denmark) or in a renewed and greatly expanded form (e.g. Britain, Germany and Sweden). This expansion was accompanied by the emergence of the discipline on an international level, which endowed the International Political Science Association with a truly international character.

On all continents, the full array of sub-disciplines included institutional and behavioural studies devoted to a single country, comparative analysis, public administration and the related expanding fields of policy studies, local government, international relations, political sociology, constitutional history and law, political economy, and – no longer a core component but rather one of many specialties – political theory and philosophy.

This impressive expansion has been accompanied by enhanced research methods. Thus a previously predominant concern for political institutions and processes on a national level (principally in Latin America, Europe, Australia, Japan

and India rather than in the United States) was progressively enriched by a stronger research orientation towards international relations and organizations and towards local and regional level government. In terms of research methods, the 1960s were the breakthrough years of the pending behavioural revolution, which were partly the result of the efforts of European scholars in the interwar period. No longer could historical, juridical and philosophical reasoning, taken alone or collectively, be considered sufficient for the analysis of political phenomena. Methods and techniques previously elaborated in statistics, sociology, psychology, and economics were now being utilized by political scientists on a vast scale.

This shift in research methodology coincided with the expansion of the discipline. In Europe, it was often complemented by the introduction of a more formalized graduate programme generally with compulsory courses in research methodology. A recurrent stimulus was the European Consortium for Political Research, itself a product of the 1960s, which through its annual workshops, research groups and summer schools exerted a lasting influence on several generations of young European political scientists by creating an informal 'invisible college' of younger scholars. In those universities and countries where this shift was most actively pursued, there were certainly instances where pre-existing juridical, historical and philosophical competence was either partially lost or could not keep up with developments in related disciplines thus becoming gradually antiquated and out of touch with the initial rationale for the use of these traditional methods.

Apart from external political-societal reasons for the predominance of one particular mode of disciplinary identity, the defining factor of the early pre-war period was that the only country in which the political science structures had sufficient size and scope to make widespread international impact was the United States. In the early 1950s, the American disciplinary association had more than 5,000 members, whereas European membership averaged less than 1 per cent of that number. Today membership in America has tripled and the combined enrolment of European political science associations has yet to reach 5,000 members.

With the exception of Britain, France and possibly Germany and Sweden, the United States seemed to be the only country whose version of a science of politics clearly responded to the intellectual concerns of institutionally successful precursors of the late nineteenth and early twentieth centuries. As noted by Bernard Crick, at least from the time of the address by the then-president of the American Political Science Association, Charles Merriam, in 1923 to the address by Pendleton Herring thirty years later (and to the one delivered by Samuel Huntington another quarter of a century later), there has been a persistent notion that political science is intimately linked to the intellectual and institutional history of the United States and constitutes an American-conceived science that has successfully spread to a range of nations, whose effective, if belated, acceptance of a pluralistic political system has qualified them as proper recipients of this intellectual heritage.

However understandable such a perspective may be, it is based upon the misperception that political science is identified with a particular form of inquiry – related to liberal individualism – that played a predominant role within the first professional political science community, which has since become an international model. Nonetheless, from both a historical and contemporary perspective, this simple identification cannot be easily upheld. In fact, American political science may show signs of renewed dependence on theoretical discourse as it has evolved in other continents over the last decades of the twentieth century.

In the major sub-disciplines of political science, substantial differences in terms of emphasis and major foci continue to exist. Thus in political theory and philosophy, liberal individualism largely seems to serve as a tacit point of departure for much, if not most of, American political philosophy. No doubt these types of theorizing, as epitomized by rational choice theorizing, continue to exert an important influence in Asia, Africa, Latin America and Europe as well. However, other equally influential modes of political philosophy are prevalent. One major development has been the tendency to link previously separate fields of theoretical research, and particularly the linking of an institutional analysis of the conditions for preparing and implementing policies with a normatively oriented analysis of the implications of such policies for justice in society.

In all countries, most political science activities continue to focus on the actual workings of national political systems. Studies of legislatures, executives, political parties, interest groups and electoral behaviour tend, almost by necessity, to focus on the national context. This is most true of the purely institutional analysis. Thus, there has long existed a strong international and comparatively oriented research community in fields such as electoral behaviour and the study of the role of mass media in the political process. The seemingly secular erosion of traditional party identities and affiliations in Western Europe and the dramatic transformations occurring in Eastern Europe have also served as a powerful stimulus for comparatively oriented studies.

Much the same holds true in another sub-field of political science, namely the study of public administration and public policy. A strong and vital tradition in recent decades has pushed this type of research far beyond a concern for only the formal workings of a government administration or the comparative study of attitudes of bureaucrats and politicians, whether at the national, regional or local level. Instead current research increasingly focuses on the actual processes of policymaking and policy implementation. This type of research was often stimulated by the expansion of government activities and policies and by the perplexing failures of government programmes in terms of 'implementation deficits'. A large body of research has tried to examine to what extent and under what conditions political forces can affect not only government decisions but also actual policy outcomes. In an age of growing international interdependence, intractable long-term problems, such as the conditions of the human environment and the nature of economic policy, have stimulated interest in such research.

A significant development currently underway involves efforts to associate an analysis of the workings of public and private organizations with the study of the conditions for long-term institutional change.[3] Clearly, the slowly changing fundamental role of national governments and the emergence of a new confederate political entity, such as the European Union and its vast organizational structure, offers yet another major opportunity to analyse the development of political and administrative arrangements.

In the sub-field of international relations, subjects such as the East-West conflict, interaction between the developed and developing countries and the functioning of large-scale international organizations previously predominated. In

recent years, however, a range of new research efforts designed to come to terms with the rapidly changing international scene has emerged. This has occurred alongside interesting and fundamental restructuring within the study of international relations itself, including questioning analysis that takes a purely *realpolitik* approach more or less for granted. Thus, the study of international relations is currently engaged in a fascinating process of change.

## POLITICAL SCIENCE IN THE PRESENT AGE: DIALOGUE AND DIVERSITY

The present situation might be summed up succinctly by means of two observations. First, the advances in the development of research methodology and knowledge about the real world of politics in recent decades have been impressive. In many ways, the history of political science in the twentieth century must be seen in terms of developments before and after the broad professional breakthrough of the discipline in the 1950s and 1960s and the ways in which this breakthrough produced focal points concerning debates about texts that came to be regarded as 'modern classics' without the emergence of any single strict methodological canon.

In this respect, the 'post-behavioural' phase of disciplinary development from the 1970s to the present has been marked by the co-existence of a strong empirical and survey research tradition, of public policy analysis and systematic empirically oriented comparative politics and international relations research alongside a renewed interest in normative political philosophy, a rediscovery of institutions, including macro-historical studies of state institutions and state systems but also the introduction of various types of linguistic and rhetorical analysis. In this later period as well, however, we might ask whether the co-existence of different sub-disciplines prevents consensus over which works deserve to serve as focal points for intellectual debates.

Secondly, differences in research interests and style in political science persist and cannot realistically be expected to disappear. As previously pointed out, such differences must be understood against the background of the substantial differences in the role and conception of state and public activities in various parts of the world, not least between the United States and a number of European countries. These differences reflect the fact that the development of the social sciences must be analysed against the backdrop of intellectual traditions as well as institutional legacies and broad societal concerns.

It is important to recognize the foundational and reflexive nature of political inquiry. Political scientists should emphasize the dual nature of the discipline's history, on the one hand, grounded in issues centring on argumentation and power, talk and force, signification and domination and on the other hand, a relatively recent set of professional practices.

A roundtable of American political scientists in the early 1990s examining the nature of contemporary political science came to a similar conclusion as to the present state of the discipline. Thus one objective for an examination of the development of political science must be to account for the special nature of political science as a discipline. On the one hand, it is one modern social science discipline among others, and in this respect it has proven its mettle, even if its modern guise remains relatively new in some countries. On the other hand, it is largely and essentially clustered around a set of key concerns about the legitimacy of rulers and the making of the basic rules and societal institutions, i.e. the problems of constituting a political order. These concerns are not transient but recur with each successive generation. The foundational transformations of Eastern and Central Europe have once again forced these basic questions of political inquiry onto political and scholarly agendas.

It follows that a search for a solution to the most essential problems of politics and order must be an in-depth inquiry that draws on knowledge from diverse fields. Any truly innovative political inquiry has to be contextually sensitive and must rely on knowledge available in various social science and cultural science disciplines. This position is widely recognized by most observers. However, to account for this particular position of political science and inquiry, the analysis of the formation and development of the discipline in different national contexts must be pursued not as a pastime for the sake of recording recent achievements but as a major component of intellectual advancement.

## POLITICAL SCIENCE IN THE FUTURE

Political science has to a large extent emerged and evolved as a confederation of diverse practices held together by institutional consensus rather than by a common conception of a theoretical research programme and scholarly tradition. This may help safeguard a fair amount of intellectual pluralism and guarantee scholarly vitality and growth. However, it probably also leaves the field more open to societal and administrative influences and less able systematically to draw on theoretical advances in related intellectual fields. Just such an observation was a major premise of David Easton's classic study, *The Political System*. Easton's concerns are echoed in the words of David Held, a scholar of a later generation who argues for the need for a discipline that systematically confronts the abstract normative reasoning of political philosophy with a keen understanding of the actual constraints and potentials in terms of various social groups' power resources and of the processes of distributing such resources. These optimal conditions are more urgently needed when preferences are initially being formed rather than when these preferences are assessed in terms of costs and benefits of courses of action. This position is consistent with the type of broadly historical comparative study of politics and society envisaged in the writings of Weber and Durkheim, who sharply criticized the emerging discipline of political science for ignoring this point.

Nowadays, when social scientists once again have to question the very form of political organization upon which so much of their theorizing is premised, the archetypical nation state, and its presuppositions concerning amply available natural resources and increasingly efficient technology, Held's warning against complacency and disciplinary myopia should be interpreted as a scholarly challenge rather than a threat.

The fact that the basic political and societal macro-institutions that have been more or less taken for granted for at least a century and a half – i.e. the modern nation state, the modern large-scale corporation, the modern research-oriented university and modern science itself – are currently undergoing fundamental transformations should

make such scholarly flexibility seem not only natural but necessary. Clearly, a number of assumptions concerning our deepest cultural and national identities and their relationship to the basic forms of political and social organization have to be examined anew with the same readiness to undertake foundational inquiry as political philosophers and students have shown in earlier periods of fundamental change.

In this respect, the special nature of political science as a field within a relatively modern profession dealing with perennial questions about the nature of the political order and the legitimacy of ruling and power should be seen as an asset rather than a liability, but to do so, political scientists must first face up to their own history and its legacies. This is important not so much for the future of political science as a profession (the continuation of a lively confederation centred on professional concerns seems reasonably secured), but because an understanding of the position of modern humankind requires facing some very difficult questions concerning our identity and the manner in which our words and actions are linked to societal rules and resources. These are, indeed, the kind of questions with which the best kind of political inquiry has always been concerned, i.e. a political science with a focus on the problems of argumentation and domination, discourse, institutions and history, and with a great degree of openness towards other disciplines. Such scholarship will be crucial to the civilized community of humankind in the face of greater demands for institutional learning and environmental and human sensitivity in the future. Thus the prospects of such a political science are relevant far beyond the confines of the discipline itself.

## NOTES

1.    P. Norris, 'Towards a More Cosmopolitan Political Science?', in: *European Journal of Political Research*, Vol. 30, No. 1, 1997, pp. 17–34.
2.    J. E. Trent, 'Institutional Development', in: W. G. Andrews (ed.), *International Handbook of Political Science*, Westport, CT, 1982, pp. 34–46.
3.    J. G. March and J. P. Olsen, *Rediscovering Institutions: The Organizational Basis of Politics*, New York, 1989.

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# 19.9
## LINGUISTICS

*Stephen A. Wurm*

In the early twentieth century, the school of comparative-historical linguistics that had dominated the nineteenth century was increasingly overshadowed by structuralism and other theoretical approaches. Nevertheless, comparative-historical linguistic work continued to have a following among scholars studying less-known languages such as Austronesian (Dempwolff), South-East Asian (Benedict), Uralian (Rédei), Altaic (Poppe), African (Greenberg), and American Indian (Campbell and Mithun). In recent decades, the approach has delivered some spectacular results in these previously neglected areas. A striking example is the postulation of the huge Papuan Trans-New Guinea Phylum by McElhanon and Voorhoeve and Wurm, which comprises about 500 of the approximately 750 Papuan languages, and whose existence is now being documented. Comparative work by Foley in some Papuan language families should also be mentioned. Another outstanding recent example is the wide-ranging comparative-historical work by Ross in a large number of Austronesian languages in Melanesia in the south-west Pacific. Similar work is underway in some other parts of Australia, South-East Asia, and the Americas. At the same time, T. Gamkrelidse and V. V. Ivanov, two linguists from the Republic of Georgia, arrived at important new insights into the Indo-European language system. Also, a new trend in linguistics, paleolinguistics, appeared with the reconstruction of ancient phonetics and semantics, e.g. in the works of B. Kalgren, G. Malmquist, E. Pulleyblank, S. Egerod in Chinese; N. Marr in Caucasian languages; and J. Meshchaninov in Arctic languages.

Despite these important contributions, the main linguistic stream in early-twentieth-century Europe and America was a structuralist approach to language. The first proponent of this theoretical approach in Europe was the Swiss linguist Ferdinand de Saussure, whose contributions were published by Charles Bally and Albert Sechehaye in 1916, three years after his death. One of his lasting legacies to twentieth-century linguistics was the sharp distinction between the *synchronic* and *diachronic* approaches in linguistic study. Also very important for modern linguistics was his recognition of the opposition between the social and systematic side of language as an abstract model (called *langue* by him) and individual speech as concrete

manifestations (*parole*), and his claim that linguistics should be studied within the wider context of the study of sign systems in society, which he called 'semiology' and which later became known as *semiotics*. Another important view held by Saussure was that language is not a substance, but a form.

Saussure's ideas, and especially his concern with the abstract and systematic aspects of language, were challenged by Louis Hjelmslev, the most important member of the Linguistic Circle of Copenhagen, who developed the theory of *Glossematics*. He argued that linguistics could only describe relations, i.e. dependencies or functions between items, not the items themselves. One of the important features of glossematics was the study of content and form in trying to arrive at a structural investigation of semantics. *Componential analysis* has parallels to this and has influenced other schools of linguistics such as *stratificational grammar* and, in dealing with general semiotic concepts, has had an influence on semiotic theories.

Another leading school of linguistics in the mid-twentieth century was the Prague School. It was the first to recognize the function of the *phoneme* as the basic unit of phonology, whose sound properties distinguish words of unlike meaning in a language as defined by Roman Jakobson, a leading member of the Prague School. They recognized the presence of binary oppositions of phonemic pairs whose members differed in a single distinctive feature, calling the opposing members *marked* and *unmarked*. These concepts reappeared in other theoretical approaches in the latter part of the century. Binary phonemic oppositions were recognized as constituting the phonological system of a language. Adherents of the Prague School, or Praguians, tried to formulate general universally valid phonological rules and examined the degree to which phonemes were utilized in a specific language; their work proved useful for language teaching and was a precursor of later research in contrastive linguistics and language planning. The Praguians realized that the sound system was only one part of a language, with phonology and morphology being very close relations. Nicolai Trubetzkoy, one of their members, introduced the still valid concept of the *morpheme*. Linguistic diachrony also attracted the Praguians' interest, as did questions of

written language, which was viewed as being systemically independent from spoken language.

The London School was another major twentieth-century centre of linguistics research. Its founder and principal proponent was John Rupert Firth, who established linguistics as an academic discipline in British universities in the decade after the Second World War. Firth's main interests lay in *prosodic phonology*, which challenged existing phonological theories, and in semantic theory. Prosodic phonology did not intend to produce the simplest overall description of the phonology of a language but to give a clearer, more coherent account especially suitable for studying data in terms of a polysystemic statement. In this prosodic phonology, termed *prosodic analysis* by Firth, no one-to-one relationship between phonetic and phonological items is assumed. Rather, it presupposed an interdependence of phonology and grammar, thereby rendering any intermediary morphophonemic level unnecessary. The polysystemic approach allowed the setting up of separate phonological systems for grammatical structures, and for special phonological systems for loanwords. Another of Firth's interests was the study of linguistic meaning in terms of contextual semantics, called the theory of the *context of situation*. It was his belief that semantics was central to linguistics, a position that strongly contrasted with the views of many linguists of the day, especially in America. Firth took the view that every language was embedded in the culture of its speakers. This view also led him to pay special attention to what he called *restricted languages* with their own vocabulary and grammatical and even phonetic features, and used in specific contexts, such as professional technical language, rhetorical speeches, official correspondence and so on. Firth's linguistic views later became influential in Halliday's *Systemic Grammar*, which presented a comprehensive linguistic theory and analysis like the one Firth had intended to produce. Also, recent post-phonemic phonological approaches such as *autosegmental phonology* are close to Firth's views on phonology. This autosegmental phonology developed from research into generative phonology in the 1970s when some problems in that phonological theory became evident. Until then, the prevalent view held that speech was linear and consisted of a single sequence of phonemes separated by discrete boundaries. However, increasing evidence from descriptions of Asian and African tone languages indicated that speech sounds showed much overlap, with tonal features only loosely related to the segmental phonemes with which they were connected. This and similar problems in the analysis of complex segments convinced more and more linguists that the segmental view of phonology needed revision, thus leading to the development of autosegmental phonology.

A crucial chapter in the history of linguistics in the twentieth century is *American structural linguistics*. Its basic tenet, held by many linguists, was that the discrete elements of language formed structures and patterns. Great importance was attributed to spoken language, and intellectual ties between linguistics and anthropology were close. This current originated in to the late nineteenth century in connection with work in Native American languages. Anthropologist Franz Boas had observed that inconsistencies in the transcription of words from these languages made it possible to guess the nationality of the transcriber, which in turn made it possible to place into a cultural matrix structural views in language resulting from the observation of verbal interaction. Edward Sapir, one of

Boas' students, brought the descriptive model close to modern structuralism in his insights into the link between form and meaning. Leonard Bloomfield exercised very strong influence on American linguistics in the first decades of the twentieth century. He advocated that linguists should work without preconceptions and observe the forms of each language in order to establish their language-specific functions. He rejected the traditional belief of linguists that there were presumably some universal grammatical categories in every language. In their work, both Sapir and Bloomfield emphasized the distinctive sounds and forms in languages and meaningful distributional patterns. This focus on forms specific to each language was expanded after 1940 by other American linguists such as Bernard Bloch, Charles Hockett, Zellig Harris and George Trager, whose *distributionalism* largely avoided considerations of meaning in linguistic analysis and relied on a solely distributional analysis of a *corpus*, i.e. written linguistic data. Semantics was considered too vague, and synonymy – in terms of identity of distribution only – was regarded as non-existent. In their work, the contrastive and non-contrastive distribution of elements was central to analysis.

*Generative grammar* was introduced by Noam Chomsky (Plate 102) His theoretical approach was based on generative syntax and the rejection of structuralist linguistics, though Chomsky and his followers used distributionalist techniques in the tradition of American structuralism. Chomsky's theory has moved in a number of different directions since its inception, but they all share two main aims: to formally describe the universal features of grammars of individual languages and to describe the inherent knowledge, referred to as *competence*, which native speakers possess about syntactic, phonological, morphological, and semantic patterns in their language. Both generativists and structuralists believe that a grammar is a description of the structural relationships between elements in a given language. In fact, generative competence, and what is called *performance*, are modern reinterpretations of Saussure's *langue* and *parole*. One major difference between the generative and structuralist approach is found in the goal of linguistic theory. Structuralists established lists of linguistic elements of a language and indicated their distribution, whereas Chomsky's theory aimed at defining what kind of grammatical processes *can* occur in language in terms of a universal grammar which he regarded as an innate faculty of the human mind, brought into being by the child in the course of acquiring a language. Generativists adopted the view of Bloomfield's successors that syntax could not be derived from the study of meaning as the *autonomy of syntax*.

The Prague School also influenced generative thinking, especially in phonology, but also in the search for linguistic universals. Generative syntax has been influenced by Otto Jespersen's views, and generative grammar has been aided both by studies in mathematical logic from the 1940s and 1950s, and changes in the views of philosophers of science and developments in cognitive psychology. Chomsky's 1957 theory relied on *phrase structure rules* and *transformations*. The latter changed grammatical relations, and produced complex sentences from simple ones. In 1965 Chomsky presented the *standard theory* of generative syntax. In this, phrase structure rules made so-called embedding transformations superfluous, and introduced a separate lexicon. This made it possible to postulate a separate level of deep structure, which was also the seat of semantic interpretation, while transformational rules

imposed deep structures onto surface structures. After 1965, one new development in syntactic theory was *generative semantics*, which rejected the need for a separate deep structure level on the grounds that transformational rules already present imposed semantic notions directly on surface structures. It moved away from many of the conceptions of generative grammar, but eventually died out by the middle of the 1970s.

After 1965, an Extended Standard Theory (EST) developed, splitting into two theories following the demise of generative semantics, with both of them still pursued today. One of them, developed by Chomsky himself and called the Government Binding (GB) Theory, is characterized by the gradual replacement of language-specific rules by general universal principles of extreme abstractness and complexity of supporting arguments. The other has two branches, the Generalized Phrase Structure Grammar (GPSG) and the Lexical-Functional Grammar (LFG), which are closely interrelated and used within computational linguistics. They are much more directed towards surface-structure and require more formal semantic interpretations of structures than GB.

An important parallel to generative grammar was *generative phonology*, which operated in a succession of phonological rules. The presentation of phonological processes was very abstract and segmental. There have been challenges to its abstractness and elaborations of more complex phonological representations than originally presented. Of these, autosegmental phonology has already been mentioned as also drawing on Firth's views and those of the London School. Among other elaborations, *lexical phonology* may be mentioned; it is concerned with the relationship between phonology, morphology and lexicon and claims that all morphological and many phonological processes take place in the lexicon, with so-called lexical and post-lexical phonological rules operating.

Morphology did not constitute a separate unit in generative grammar until 1970, but was treated as a part of phonology and syntax. Chomsky gave it the first specific role in 1970, and in 1973 Halle produced the first model of *generative morphology*, which is morpheme-based and works inside the lexical component of the grammar. This model has since been elaborated on.

Among other linguistic theories current in the twentieth century, Halliday's systemic grammar has already been mentioned as expanding Firth's work. It also draws on Hjelmslev, the Prague School, and others. It constitutes a type of functional grammar describing the manner in which grammar is organized to make meaning. Because of this, its use in educational, computational, and text linguistics has been extensive.

*Stratificational grammar*, studied by Makkai and Lockwood, was an approach developed by Sydney M. Lamb beginning in the late 1950s on the basis of post-Bloomfieldian theories and Hjelmslev's glossematics, adopting from the former the notion of the distinction between (a) possible combinations between morphemes and phonemes, and (b) the system, which described the realization of morphemes in terms of phonemes. This produced a two-stratum model dealing with morphemes and phonemes (phonology) through a morpho-phonemic system. From glossematics came the concern with content and expression, with texts rather than single sentences, with the relationship between linguistics and semiotics, and with the concept of language as a network of relations. The two-stratum model was expanded with the four-stratum one containing sememes (semotactics), lexemes (lexotactics), morphemes (morphotactics), and phonemes (phonotactics). Influenced in part by Halliday's *Systemic Grammar*, a notation for the representation of linguistic structure as a network of nodes and lines was devised. Stratificational grammar intends to give a description of language, which can constitute a basis for a performance model.

A general theory of *tagmemics* was presented by Kenneth L. Pike. Tagmemics uses the concept of *slots* (positions) in a structure, filled by classes of items. The final development of tagmemics is a four-cell tagmeme, which encompasses the levels of the hierarchy from conversation to phonology and reaches out to events and situations. Semantics is in all hierarchies, with the native informant part of the database. Language is assumed to consist of form/meaning composites within a culture or society. The concepts of *Emic* and *Etic* (in analogy to phonetic) are used to describe native reaction to elements. Pattern is regarded as more basic than logic. Tagmemics is particularly significant because members of the Summer Institute of Linguistics have been using it in many of their descriptions of exotic languages in the Americas, Africa, continental and insular South-East Asia, the Philippines and Taiwan, New Guinea, Australia and other parts of the Pacific; much of the extant material in and studies of such languages is accessible only through tagmemic descriptions.

Outside the predominant preoccupations of twentieth-century linguistics with internal linguistic factors and principles lies the 1986 study of *pidgins and creoles* by Mühlhäusler. No longer neglected, these languages are proving significant to linguistics in general, to the study of language change and to the realization that there are greater numbers of mixed languages than was recognized before. In pidgin and creole languages, change has occurred very rapidly; this development constitutes a serious challenge to some basic tenets of historical/comparative linguistics – namely that all languages can be genetically classified and that language mixture is a limited and very rare phenomenon. Pidgins and creoles owe their origins to non-genetic development, and they are not suitable for genetic classification and reconstruction. These languages show very clearly the importance of social context in language change. Work during the last few years has been increasingly concerned with the study of pidgins, creoles, and heavily mixed languages based on exotic languages, with interesting results.

The highlighting of social context brings *sociolinguistics* into focus, and especially in highlighting the role language plays in communities where two or more languages are used, and in what Haugen terms *language planning*, which constitutes a systematic response to language problems. Sociolinguistics looks at the creation of new alphabets, standardization, codification of morphology, modernization, language maintenance, and questions of the use of two or several languages side-by-side in a given country or area, or the role of minority languages. For instance, since the 1970s, Australia has changed its policy on minority languages from assimilation to multiculturalism. There is increasing pressure in many industrialized societies for linguistic pluralism and the emergence of new social functions for minority group languages.

In recent decades, there has been an increasing interest in the study of exotic languages in many parts of the world. For

instance, scholars of the former USSR such as B. Serebrennikov contributed many studies of minority languages in that country. V. Solntsev studied eighteen previously unknown minority languages in Viet Nam. In their contributions to the Canberra series on *Pacific Linguistics*, linguists have published many detailed descriptions of languages in the Pacific region and South-East Asia, and Amazonian languages in South America. This research trend has received a strong boost as more and more linguists come to regard language as an intrinsic part of the culture and society of its speakers and realize that each language and speech community reflects a unique worldview and way of thinking. Culture is reflected in the semantic and structural patterns of each language, with each language offering new insights. This realization has greatly increased interest in the study of endangered languages,[1] because with the death of a language, an irreplaceable part of our knowledge and understanding of language is lost forever. In 1993, UNESCO supported a programme to study endangered languages called the *Red Book of Languages in Danger of Disappearing*. It sponsored the production of a small pilot *Atlas of the World's Languages in Danger of Disappearing* in English, French and Spanish. The Permanent International Committee of Linguists (CIPL) and UNESCO itself, through its International Council of Philosophy and Humanistic Studies (CIPSH), assisted a number of studies on endangered languages, with the results to be published. At the same time, linguists and organizations like UNESCO are taking much more interest in the preservation and maintenance of endangered languages, and the revival of moribund ones.

The simplification of many characters in the Chinese alphabet may be mentioned as a special achievement; the feat gave a great boost to literacy in China. This and the rapid spread of the most widely used form of Chinese, known outside China as Mandarin, has greatly increased the possibilities of intercommunication between speakers of mutually unintelligible forms of Chinese.

Finally, the last two decades of the twentieth century witnessed the production of large *language atlases* of use not only to linguists, but also to professionals in related disciplines, and covering China, most of Asia and the Pacific, the Americas and the rest of the world.

## NOTE

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# 19.10
## GEOGRAPHY

*Paul Claval*

## GEOGRAPHY IN 1914

Geography differs from other social sciences in the way in which it became formally established as a discipline. Maps, censuses and information about environments being indispensable to the functioning of modern states, cartographic, hydrographic and statistical services, cadastral surveys and weather observation stations appeared in Europe and the United States at the end of the eighteenth and the first half of the nineteenth century. Teaching did not play a decisive role until the 1860s in Germany, the 1870s in France and the 1880s or 1890s in other European countries, when, at a time of deepening nationalist tensions and the scramble by the imperial powers to carve up the world, it seemed vital to teach future citizens about their country, its colonies and the state of the world. Geography featured prominently in curricula from primary school to university.

Academic geography aimed at scientific rigour. It was modelled on the natural sciences even when dealing with social realities. That tradition went back to the naturalist philosophies of the early nineteenth century, and the popularity of evolutionary theory reinforced the trend.

Physical geography, encompassing the specialized fields of geomorphology, climatology, hydrology and the geography of soils and plant life, occupied a prominent place in many countries; in Germany and Russia the idea of putting particular emphasis on the global study of environments began to make headway.

Geographers who concentrated on social phenomena sought to answer three questions: (a) What human distributions can be observed on the Earth's surface? (b) How can the diversity of landscapes formed by social groups be explained? (c) What are the interactions between people and the environment? The emphasis on one or another of these themes varied from country to country. German geography, the oldest and most prestigious school thanks to the work of Alexander von Humboldt (1769–1859), Carl Ritter (1779–1859) and Friedrich Ratzel (1844–1904), was more particularly concerned with landscapes and regional distributions. French geography, which developed rapidly from the 1890s, under the impetus of Paul Vidal de la Blache (1845–1918), also took regional

structures as a starting point but associated them with people/environment interactions, which it described in terms of life-styles. In the United States, where institutionalization came rather late, Carl Sauer (1890–1975) developed a school between the two world wars, which used the analysis of landscapes to assess the links forged by cultural groups with the environment they inhabited and exploited.

Other countries borrowed from Germany (Russia, Eastern Europe), France (Great Britain, Netherlands, Hispanic countries) or from both of them (Romania, Italy, Scandinavian countries). Outside Europe and the United States, geography had only really reached Japan, which drew its inspiration principally from the German school.

Geography in the late nineteenth and early twentieth centuries was equally involved in making an inventory of the Earth. This task was particularly important for the countries where the knowledge of natural resources and possibilities remained incomplete – the United States, Canada, Australia, Brazil, Russia, etc. This task went on after the First World War, especially in the USSR. The results of these researches were very important, particularly in the cold areas of the two hemispheres: exploration of the Antarctic thanks to the efforts of international teams, and detailed surveys of the North Pole region in Canada, Greenland and Russia led to better understanding of life under extreme conditions and the processes that shape these environments.

## THE DEVELOPMENT OF GEOGRAPHY UP TO THE MIDDLE OF THE CENTURY

The end of the First World War disposed of some of the factors that had fostered the rapid rise of geography as a formal discipline at the end of the nineteenth century. Nationalism in Europe had lost its virulence. The imperialist expansion was over, and many people sensed that decolonization would soon proceed. The communist movement, which had transformed the Russian Empire into the USSR, was hostile to nationalism until the 1930s.

Academic geographers were less interested in current affairs than they had been before the First World War.

Their main concern was to ensure that the discipline flourished. The geography that developed between 1920 and 1940 in Western Europe and between 1930 and 1940 in the United States gave pride of place to fieldwork; geographers mustered the resources provided by official mapping and statistics services, made precise observations and carried out surveys and interviews. Their work was largely concerned with describing landscapes and identifying regional structures. Publications tended to focus on small territories, urban areas or regions. Geographers were more inclined to study combinations of elements deriving from detailed surveys from a synoptic regional standpoint than to carry out comparative studies. French geographers were widely admired and emulated because they were the undisputed masters of the art of describing and interpreting regional patterns, as can be seen from the work of Emmanuel de Martonne (1873–1955) and Albert Demangeon (1872–1940); this was because they had been trained as historians, which taught them to be aware of the slow pace of change. They thus paved the way for the *Annales* school of history.

On the whole, academic geography had little contact with the other social sciences, but its lines of inquiry were not dissimilar to those of history or anthropology at the time: there was a parallel between the geographers' regional approach and the emphasis on the specific features of each period or each culture observed in other disciplines.

New fields of interest emerged. Before the First World War, studies of non-European countries assessed their potential for colonial penetration. Hardly any attention was paid to the problems arising from attempts to exploit environments very different from those encountered in Europe or the United States.

The perspective changed between the wars. The areas under colonial domination were well established – the problem was one of developing them. Planters discovered that soil in hot, humid countries was often poor, and that it eroded rapidly after clearing. The robustness of the natural vegetation was misleading: it thrived in what was virtually a closed circuit and could reproduce with practically no need for any additional mineral input. The methods devised by the local communities to make the most of such difficult surroundings began to be understood. Tropical geography emerged.

In the industrialized world, rural areas had been the focus of attention until the First World War. Urban geography then overtook rural geography. Towns were classified according to size and function, as were the areas under their sway. Walter Christaller (1893–1969) laid the foundations of central-place theory in Germany. The role of urban areas enabled the problems of regional spatial division to be addressed from a new perspective: that of polarized areas.

The world between the wars was unstable. Germany considered the Treaty of Versailles to be unfair; Italy and Japan felt ill-equipped for international competition because they had arrived too late in the race for a colonial empire. These states questioned the international political and economic order. This explains the success of political geography and the attempts in Germany to apply it in practice under the name of geopolitics.

Geography thus branched out into new fields of inquiry in order to prove its usefulness to the societies where it was taught. The main focus of interest was economic: the world was concerned about the unequal distribution of resources since international tensions sprang from the contest for raw materials. Geographers were keen to analyse these problems, but as they had no firm analytical foundations for their studies, the work they produced remained descriptive and had little impact on political or economic decision-making.

In the classical period of its development, then, geography was undeniably enriched by new fields of study. It failed, however, to respond to the most urgent needs of society. In Great Britain and the other countries where coal had formed the basis of industrial development in the nineteenth century, whole sections of the economy began to collapse and restructuring was required. In the United States, the over-brutal exploitation of resources led to ecological crises so acute that the federal government had to intervene – as in the case of the Tennessee Valley Authority, for instance. In the USSR, the emphasis was on the rapid development of new industrial centres further and further to the east in often-extreme living conditions.

From the 1930s, geographers were in demand for regional planning and controlled land-use projects. They were called upon for their expertise in spatial organization, but the talents of naturalists, economists, sociologists, architects and town-planners were also sought. The need for land development became more pressing in the 1940s. With the war over, public opinion no longer accepted that certain regions of the industrialized countries should fail to benefit from the overall prosperity and that in the Third World entire nations were sliding into poverty at a time when technical production capacities were steadily improving.

From 1914 to the middle of the century, geography generally played a more modest role than in either the previous or the following period. That does not mean that it did not enjoy some success. Major regional studies made the discipline better known to the educated public. Everyone had heard of the geopolitical theories or resource analyses produced in great number by specialists in economic geography. The land-use register produced in Great Britain between the wars under the direction of Dudley Stamp (1898–1966) was to prove a valuable tool when it came to planning the war economy.

On the whole, however, a feeling of dissatisfaction spread among geographers. Their knowledge did not respond to the land development needs of contemporary societies. Traditional geography seemed more suited to the rurally based units, which pre-dated the industrial revolution, than the complex industrialized societies.

Geography remained a Western discipline: it was now established in all the European countries. It met with considerable success in the British dominions and reached South America, in particular Brazil. Japan continued to draw inspiration largely from the German model, but developed its own vision of the relations between human groups and their environment. In the USSR, the crushing influence of Marxist orthodoxy diverted many researchers from human and economic problems; in the field of physical geography, the emphasis on the study of environments, already apparent in tsarist Russia, was strengthened.

## RESTRUCTURING AND EXPANDING THE DISCIPLINE

This inward-looking phase was followed, from the 1950s onwards, by a movement of reconstruction and expansion, which brought about a radical change in the discipline. It

was no longer modelled on the natural sciences, and became a social science.

Traditionally, the discipline had been concerned primarily with describing and elaborating typologies rather than with formulating theoretical hypotheses, looking for regularities and establishing a general corpus of knowledge. The studies on spatial economics and the research work carried out by Walter Christaller in the 1930s attracted attention for the first time. The new geography that developed from the mid-1950s in the United States assessed the impact of distance on the distribution of human activities; it also drew on the research carried out before the Second World War by the Chicago School of Urban Ecology to explore the social structure of cities. The change came lastly from systematic recourse to sophisticated statistical methods. Factor analysis efficiently processed the large quantity of data often available to geographers; the interpretation of distributions was no longer dependent on mapping alone: maps were a powerful analytical tool, but reading them was too subjective. Remote sensing provided a direct view of the Earth.

Although the new geographical research began in continental Europe as early as it did in North America, the movement was perceived to be Anglo-Saxon and more specifically American. The new goals set for geography were too far removed from those of the German and French schools for them to accept the new trends without some resistance.

In the international field, the consideration with which geography has been held is evident in the prominence accorded to it in settling various international disputes or problems. Geographers were much consulted during the negotiation of the Treaty of Versailles, in 1919. Later, they intervened for settling borders in Asia, for the definition of sea economic zones in South America and for the protection of the environment. Geographers have also been consulted by their governments for the exact coordinates of cities and strategically sensitive sites of interest to the military.

The new geography of the 1960s supplied satisfactory answers to questions relating to urban and regional land development, and geographers were readily admitted into spatial planning teams. They worked a great deal in developing countries, where their commitment to fieldwork was much appreciated.

The change geography was undergoing made it more easily applicable to a number of topical issues. However, that success deflected researchers from such fields as historical geography, cultural geography and political geography. The new emphasis on economics was considered by many to be a loss; all the more prejudicial as the public was discovering that nature needed protecting. Ecology was becoming firmly established, but physical geography, which had presaged many of its developments, particularly in Germany and the Soviet Union, failed to take full advantage of the new trends.

The new geography movement was soon replaced by others. The importance accorded to economics in the work of the 1960s was judged to be excessive, with its failure to question even the most unjust social situations. A radical current largely inspired by Marxism (David Harvey, born 1935) developed in the Anglo-Saxon countries and spread to the rest of the world: it dealt with the geography of poverty, exclusion and marginality, neglected until then,

and inveighed against the discipline's role in traditional and new forms of imperialism.

That geography was no longer concerned with the causes of spatial diversity was regretted, and this spurred a new interest in human experience as it related to the environment. The new approaches were derived from phenomenology; geography became humanistic. Historical research flourished, as did studies on the diversity of cultures and their spatial associations.

Criticism of the new geography stressed the social and human nature of the discipline, but the accent was not, as it had been in the previous generation, on the search for a unitary structure for the discipline. In the climate of scepticism prevalent in the post-modern era, contending with a large number of different paradigms is no longer considered a handicap.

There has been a revival of interest in the lines of investigation neglected in the 1960s and 1970s, with a growing body of research on the political future of the world. The bipolar system which prevailed after 1945 has disappeared, but no one can be sure what shape the new world order will take. States, which have increased in number as a result of decolonization, are unable to meet the needs of contemporary societies. Regions or cities have to shoulder an increased burden of responsibility, and supranational organizations, such as the European Union, NAFTA and Mercosur are playing a decisive role in economic life.

Geographers are again actively concerned with the environment, studying the way in which traditional societies used and managed resources, looking at the imbalances caused by the modernization of agriculture and urbanization at the local level and drawing attention to environmental damage affecting entire regions. They are increasingly focusing on the global consequences of the destruction of the ozone layer, massive carbon emissions and the resultant greenhouse effect.

These issues involve too varied a body of knowledge and technology to be covered by any one discipline. While the problems of natural geography are attracting more attention than ever, it is not possible at present to define the parameters of a discipline specializing in these questions.

Geography has ceased to be essentially European, even though most scientific research continues to be produced in Europe, North America and the former British dominions of Australia, Canada and New Zealand. Japanese geography is among the most productive and covers all fields of inquiry.

Elsewhere, the predominant lines of investigation took their cue from various sources – French geography in the former French colonial empire, British geography in the Commonwealth, and Soviet geography in the countries that had had socialist regimes. These differences in style explain the difficulties encountered by the Arab world, for instance, in unifying a discipline divided among these various traditions.

The influence of the United States was felt virtually everywhere in the 1960s and 1970s as concepts and methods were Americanized. The new geography, and the radical or humanistic trends that followed it, affected the Soviet Union and Eastern as well as Western Europe.

Geography was one of the first sciences to have been established as an independent discipline, but it did not appear in its modern guise until fairly late in the nineteenth

century. Its success has often come more from the services it has rendered to nationalism and imperialism than from its scientific content. The geography of the beginning of the century offered a rational, positive body of knowledge. The geography practised today gives more room to people's experience of the places they inhabit. It speaks to us of roots and the search for identity. It helps us to understand why conflicts arise from issues of language, ideology and territory as much as from access to resources. It enables us to grasp some of the fundamental concerns of today's world.

The philosophies of progress, which dominated the West from the eighteenth century onwards, gave pride of place to history. Geography did not enjoy similar prestige.

The recent questioning of Western thinking has undermined the historicist philosophies: we have entered the post-modern era. In the disillusioned world in which we live, we no longer dream of a better tomorrow. Each of us strives to live as best as we can here and now. The emphasis now is on the diversity of the world and of ways of living in it and developing it. Geography is thus benefiting from the radical changes in dominant philosophies, and its status has been enhanced in the process.

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# 20

# APPLIED SOCIAL SCIENCE DEVELOPMENT AND CONSEQUENCES

*Hellmut Wollmann*

In this chapter, we will use the term *social science* to refer to a wide interdisciplinary field, encompassing economics and psychology, as well as sociology and political science. In contrast with what is usually termed *basic social science*, which deals with the quest for empirically and theoretically valid statements about the social reality, the applied orientation of social science is primarily identified with social science knowledge that is socially and politically relevant and applicable. For the purposes of our study, applied and policy-oriented social science will be considered as being synonymous. While concentrating on the evolution of applied social science since 1945, we will begin by briefly summarizing its historical antecedents, since a cursory review will enable the reader to understand more recent developments in this field.

In attempting to analyse and 'explain' the international development of applied social science over time, we will not take up the debate in the field of the history of social science examined in considerable length elsewhere.[1] Instead, by focusing on the evolution and shifts of the epistemic, intellectual and methodological agenda of applied social science as well as on the factors that have shaped it, we will depart from a fairly simple conceptual scheme in which the distinction is made between internal and external factors. While the former are seen as operating from within the social science community impinging upon its agenda-setting and on its ability to supply such applied knowledge, the latter relate to factors outside the (social) science system, that is, they remain in the societal and political sphere and touch only peripherally on the agenda of social science. With this distinction in mind, we shall also speak of the supply and demand side of applied social science.

## APPLIED SOCIAL SCIENCE BEFORE THE TWENTIETH CENTURY

An early precursor of an applied social science stance can be traced back to eighteenth-century continental Europe and particularly to Germany's quasi-sovereign states under absolutist rulers eager to make use of the entire body of contemporary scientific knowledge in ruling their emergent states and training their public servants. Under different, but largely synonymous terms – cameral sciences (*Kameralwissenschaften*), policy sciences (*Polizeywissenschaften*) or 'state sciences' (*Staatswissenschaften*) – a body of knowledge took shape encompassing economics, agriculture, finance, statistics, engineering, natural science, etc. Since the mid-eighteenth century, new professorships on cameral sciences were established at some state universities.[2] Well into the last decades of the nineteenth century, the cameral sciences held a strong position at the universities. Academically, they constituted an attempt to systemize and empirically enrich existing knowledge about the contemporary state and statecraft.[3] At the same time, they had an acknowledged practical orientation. Towards the end of the nineteenth century, however, state sciences abruptly disappeared from the universities. Owing to the period's prevailing liberalism and its claim to push back the semi-authoritarian state to a 'law and order' function and to tie it to the rule of law (*Rechtsstaat*), legalism and legal positivism prevailed in the university training of the would-be public servants. Thus, the camaralist policy sciences, which in some way anticipated the 'policy sciences' heralded by Harold Lasswell more than a half-century later, fell into decay without leaving a noticeable imprint on the future development of the applied social sciences.

During the nineteenth century, the unprecedented misery of the urban working class in the wake of early capitalist industrialization and urbanization prompted bourgeois reformers, academics as well as practitioners associating outside the universities, to conduct empirical investigations on social questions in order to persuade governments and parliaments as well as the general public to embark upon social policies. In Britain, reform-minded individuals, often belonging to the Victorian establishment, met in private reform societies, such as the famous and influential Fabian Society.[4] In Germany, historically and empirically oriented economists founded the Association for Social Policy (*Verein für Socialpolitik*) in 1873 with the reformist aim to induce the government to tackle social policies through empirical studies on the potentially revolutionary social question. Since this association, in its early phase, included Germany's most noted social scientists

among its members (including Max Weber), a good many investigations carried out under its auspices turned out to be studies that were explicitly policy-oriented and, at the same time, conceptually as well as methodologically innovative and sound. Thus, the *Verein für Socialpolitik* was considered as a model by many foreign scholars, including early protagonists of the social sciences at American universities.

In the United States, social science research was also distinguished by a reformist and ameliorative orientation, and by the pioneering role played by the American Social Science Association, established in 1865. It embraced the notion that the social scientist was to be a model citizen helping to improve the life of the community, not a professional and disinterested researcher.

## THE FIRST HALF OF THE TWENTIETH CENTURY – THE DEVELOPMENT OF APPLIED SOCIAL SCIENCE IN THE UNITED STATES AND EUROPE

In the United States at the end of the nineteenth century, the applied orientation was adopted and integrated into the further development of the university-based social science disciplines, owing to a number of internal as well as external factors, which set the American social science disciplines on a course conspicuously different from that of their European peers.

Internally, the social sciences disciplines, at an early stage, attained a significant degree of institutional consolidation and recognition within the emergent American university system, undoubtedly owing to the fact that a growing number of universities established distinct departments devoted to social science disciplines (sociology, political science, etc.). This was probably the most important institutional development in the history of the American university system. Furthermore, very quickly, each social science discipline began publishing its own national and professional journal.[5] Benefiting from institutional protection, specialists in these young disciplines saw no need, in contrast with their European peers, to sever the link between the scientific and the applied orientation of social sciences as a price for academic recognition. In addition, the applied orientation was fostered by America's prevalent philosophical pragmatism.[6]

In the 1920s, the applied orientation of social science was further implanted in the American research tradition thanks largely to the efforts of two professors at the University of Chicago: Charles Merriam in political science and Robert Park in sociology. Merriam and Park contributed to instilling the highest methodological standards in social sciences while retaining a policy orientation, their principal goal being to introduce 'more intelligent and scientific technique into the study and practice of government'.

Beginning in the 1920s, the United States Government increasingly sought advice in the fields of social science, and in the early 1930s the Roosevelt administration, when embarking upon its New Deal reforms, brought social scientists into government on an unprecedented scale, thus establishing a close relationship between government and the social science sector.

The European situation was markedly different. The applied orientation of social science in European countries remained unaffected by the development of university-based social science owing to various internal and external factors that differed significantly from the American context. First, on an institutional level, the social science disciplines advanced very slowly. Few sociology professorships were created, since the field remained linked to the departments of philosophy or law.[7] While the emergent European social science field produced pre-eminent scholars (e.g. Emile Durkheim in France and Max Weber in Germany), the precarious institutional status of these specialists along with their claim to scholarly recognition within the universities and the science system at large induced the university social scientists to promote 'truly scientific' (i.e. value-neutral and theory-driven) social science and to reject any applied orientation and so-called 'non-scientific' or 'moralizing' approach. The 'value-neutrality' debate triggered by Max Weber and the creation of the German Sociological Society in 1909 to counter the 'moralizing' Association for Social Policy are two cases in point. Except for the economists whose analyses and advice European governments increasingly turned to amidst the economic turbulences of the inter-war years, European university-based social science, by and large, abstained from an applied orientation well into the 1930s.[8]

## THE DEVELOPMENT OF APPLIED SOCIAL SCIENCE AFTER THE SECOND WORLD WAR

### 1945 to the early 1960s: the applied orientation of social science in retreat?

In the United States after 1945, the applied orientation of social science seemed destined to further ascendancy. Indeed, already during the First World War, economists, psychologists and sociologists were involved in the war through their various analytic, logistic and morale-building activities thereby enhancing the reputation of applied science. Explicitly alluding to this war experience in the early 1950s, Harold Lasswell and his associates made a plea for 'policy sciences with a policy orientation' and recommended combining the study of policy process, conducted with the most advanced methods, and the accumulation of all pertinent interdisciplinarily knowledge, on the one hand, with the application of this synthesized scientific expertise to the policymaking process, on the other. Focusing on 'the fundamental problems of man in society rather than ... the topical issues of the moment', they hoped to develop a type of 'policy sciences of democracy, in which the ultimate goal is the realization of human dignity in theory and fact'.

Yet shortly after this grand design was articulated, it was quickly submerged by the powerful current of the 'behaviouralist revolution', which seized the American social science scene in the 1950s. On the one hand, by calling for the use of quantitative methods based on new computer techniques, the new behaviouralist creed subscribed to conducting social science research in a 'truly scientific' manner consistent with the approaches of Charles Merriam and Harold Lasswell. On the other hand, the behaviouralist revolution, which truly revolutionized the American social science research tradition, programmatically severed the link between the scientific rigour of social science and its

applied orientation. A virtual conceptual 'bulwark against the Lasswellian tide of policy science' thus emerged. Consequently, throughout the 1950s, under the influence of the dominant behaviourist creed, America's mainstream social science pursued an agenda based on value-neutral and, hence, non-applied research.

Like the United States, the countries of Western Europe and Japan appeared to embrace the applied orientation approach to the social sciences after 1945. In what has been called a 'mythical promise of societal renewal through the social sciences', social science was expected to make a decisive contribution to the intellectual and moral rebuilding and revitalization of the war-stricken countries, including Germany and Japan, where the role of social science was considered particularly crucial to the reconstruction of democratic societies.[9]

Institutionally, throughout Western Europe and Japan, the university-based social science disciplines expanded markedly after 1945 by the establishment of new university positions. Yet, the new social science scholars and the financial resources remained limited, and studies in these fields continued to be based on the traditional 'single chair' principle and integrated into the traditional faculties of philosophy or law.

Even more importantly, the university-based social science disciplines, while still in a formative and precarious institutional and disciplinary stage, remained under the influence of American behaviourialism and its ban on the applied orientation, thanks largely to an entire post-war generation of European and Japanese social scientists trained in America. Moreover, in the immediate post-war period, European governments showed little interest in seeking advice from social scientists (except as regards the field of economics). This can possibly be explained by the amazing speed of post-war recovery, which did not create a need for such advice; or the fact that conservative governments, such as in Japan, viewed university-based social science with scepticism, and in certain cases hostility.

In the course of the 1960s, the agenda of social science was dramatically reversed towards the applied orientation in an unprecedented process of institutional expansion and cognitive reorientation. Again, several 'internal' and 'external' factors drove this development. First, we should note the dramatic expansion in terms of personnel and resources experienced by many universities, and particularly in the social sciences in the 1960s, when, in the wake of the 1957 'Sputnik shock', Western countries embarked upon sweeping educational and university reforms in order to catch up with the presumably more advanced Soviet Union in the fields of education and scientific research. Particularly in the European countries, where the institutional expansion of the social sciences after 1945 had been significant, albeit limited, the further boost beginning in the 1960s improved the institutional conditions for a favourable development of applied social science.

Among the most important 'internal' factors shaping the international social science agenda was a shift in the mainstream discourse of the American social science disciplines. This dramatic switch away from the behaviourialist value-neutrality back to the problem-oriented tradition of American social science occurred in the 1960s, when, in view of an increasingly problem-fraught national agenda (poverty, race riots, Vietnam War), a growing number of social scientists called for an end to the value-neutral policy-detached orthodoxy of behaviouralism and in favour of the societal and political 'relevance' of the research agenda.[10] A broad range of research approaches ensued which, mostly pursued by university-based researchers, focused on public policies from different conceptual perspectives, encompassing, e.g., (quantitative) policy-output research as well as (case-study type) implementation research. Before long, this cognitive reorientation of the social science discourse and agenda was adopted by social science communities in Europe.

While the internal debates of the social science communities influenced by the American approach led to the 'rediscovery' of the applied and 'relevant' research agenda, far-reaching changes were taking place in the political environment and in policymaking, which in turn fostered the institutional as well as cognitive development of applied social science on an unprecedented scale.

The advent of a new policy model and its repercussions on the social science agenda can be distinguished by two interrelated characteristics. The first concerns the transition from a laissez-faire type of state and policy model prevalent in the immediate post-war period to the full-blown interventionist welfare state model with its ambitious twin goals of continuous growth of the economy and the common wealth. Embedded in the context of economic growth and fiscal abundance, the belief was widely shared that the two goals should (and could) be achieved by implementing Keynesian economic policy through demand management, on the one hand, and interventionist social (as well as infrastructural) policies essentially based on planning and information tools, on the other.

This concept of interventionist policymaking went hand in hand with the belief that the proper use and involvement of the (applied) social sciences would pave the way towards a new rational model of policymaking in which the scientific analysis of economic and social developments would lead to a single, scientifically based policy choice and decision. Proclaiming the 'end of ideology', it was assumed that the increasing scientific insight and enlightenment of political and social actors (and stakeholders) into the 'objective' reality of society and its problems would induce them to renounce the hitherto prevalent political logic of policymaking based on ideological and interest-laden conflict resolution and would increase the chances of reaching a non-ideological consensus founded on social scientific expertise and an underlying scientific logic. This vision of a science-driven policy model and of an ensuing 'scientificability' of the policymaking process was epitomized by Donald Campbell's famous call for a society with 'reforms as experiments' with the intrinsic neo-positivist science model and Karl Popper's vision of attaining societal progress through piecemeal (social) engineering as its intrinsic epistemic underpinning.

In the United States, its advent can be associated with the increasing range of federal social policy programmes (such as the War on Poverty) created under President Johnson from 1964 onward. Reform policies in such areas as education, civil rights, and social policies were conceptually guided by social science theory. Evaluation research on the process and effects of social intervention programmes, often mandated by federal legislation, became part and parcel of national policies, and massive government spending on the commissioning of such research and evaluation became a

virtual growth industry. Large-scale social experimentation was initiated.[11]

Among the European countries, West Germany shifted to a full-blown welfare state and scientific policymaking model that bore the mark of the Social Democratic parties in the late 1960s. Social scientists participated in policymaking and formed virtual 'reform coalitions' with reformist politicians and administrators on an unprecedented scale. The West Germans developed evaluation research early in the process, and social experimentation was undertaken on a scale unparalleled anywhere outside the United States, placing West Germany in the forefront in Europe.[12] In some other European countries, the development of policy-oriented social science was more continuous. In Sweden, for instance, policymakers possessed much experience in interacting with social scientists. Yet, Sweden, too, underwent a kind of rationalistic revolution. New techniques of systems analysis, programme budgeting, social indicators, commissioned sectorial research, and even future studies were applied to policy problems in all areas of government activity.[13]

Governments' new demand for applied social science expertise was expressed in the following ways:

- The budgetary resources earmarked for commissioning and funding analytical work increased dramatically, thereby creating and sustaining a contractual research money market on an unprecedented scale. At the same time, traditional funding of university-housed basic research began to encourage basic research to move more strongly towards an applied orientation ('applied basic research', *angewandte Grundlagenforschung,* to refer to a hybrid term used at that time in the official language of social science policy, for instance in Germany).
- In increasing numbers, advisory commissions and bodies were set up for involving social science expertise in policymaking and policy-implementation.
- Within governments and administrations, new units and staffs were created to conduct, commission, monitor, and/or implement social science research. Similarly, governmental or quasi-governmental research institutions were established or expanded to strengthen the analytical capacities of government.

Reflecting the consensus widely shared by the period's reformist political and administrative actors and social scientists, the policy-oriented social science research undertaken at this stage can be described as largely accepting, if not supporting, the policies under scrutiny and designed to optimize the performance of the given policies and programmes.

In this period, a broad gamut of conceptual approaches and analytical tools of applied social science were advocated and employed. The following is a summary of some of the most noteworthy:

- *Systems analysis* uses decision-making criteria, assumptions and models mainly derived from economic theory to prepare in advance (*ex ante*) government decisions on complex policy measures and programmes. It falls mainly within the competence of economists. The umbrella term *policy analysis* is often used to designate these 'forward-looking', *ex ante* approaches and techniques. System analysis typically employs cost-benefit analysis. The classical example is the concept of Programming Planning Budgeting

Systems (PPBS), which was introduced in the United States in the mid-1960s. This set of instruments, which claims to provide analytical transparency, if not certainty in making decisions and choices, was at the core of the rationalist revolution of the 1960s.
- *Operations research* (OR) is chiefly rooted in mathematics and engineering and, being primarily an *ex ante* technique, uses sophisticated models and simulations to optimize solutions in complicated and uncertain situations.
- *Evaluation* has become a mushrooming field of applied social science, as governments routinely turned to evaluating public policies and standard operational procedure in policymaking. Backward-looking or *ex post* evaluation has been typically directed at analysing whether, and to what degree, the goal of a policy programme or measure was reached and whether the observable change was causally related to the policy programme and measure under scrutiny. *Ex post* evaluation is typically conducted after the programme's termination. As evaluation research, designed to measure effects and to identify causal relations, is essentially confronted with conceptual and methodological problems characteristic of empirical social science at large, it has been conceptually and methodologically inspired largely by psychology and sociology, including their claim to methodological rigour in a quasi-experimental and experimental vein.[14] Noteworthy examples are the large-scale social experiments and evaluations begun in the late 1960s and early 1970s. By and large, evaluation research has been carried out by research institutions of the entrepreneurial (for-profit) type outside the universities.[15]
- *Policy studies* is used as a rather general term comprising a broad range of studies focusing on policies, such as (internationally as well as intra-nationally) comparative research on policy-outs and public policies as well as research on single phases of the policy processes, such as budgeting and implementation.[16] Such studies are typically conducted by university-based political scientists and usually funded from university resources or through research funding from such institutes as the US National Science Foundation. Because of their explicit policy orientation, policy studies may be classified as perhaps the most important category of university-based applied social sciences.
- *Public administration* (PA) or administrative science. In the United States, PA was originally seen as centring on normative principles concerning the management of public administration with few social science underpinnings. As a result of the behaviouralist revolution of the 1950s, the development of PA was strongly shaped by the expansion and proliferation of graduate programmes in public policy at renowned universities in response to a growing demand from the public as well as the private sector. In Europe, at least in those countries with a strong legal tradition, administrative science was seen, since the end of the nineteenth century, essentially as subsidiary to administrative law. As part of the upsurge of applied social science, the 1960s witnessed a significant growth of social science-based administrative science.

## Development since the mid-1970s

The heyday of the interventionist welfare state policies proved to be short-lived, when, following the rise in oil prices in 1973, the world economy slid into a deepening recession, and national budgets dwindled bringing most of the cost-intensive reform policies to a grinding halt. The two key assumptions on which the (Social Democratic) interventionist welfare state and the upsurge of applied social science had been premised seemed to be profoundly shattered: first, the belief that, through appropriate policy instruments hinging on planning and information, the policy corridor towards continuous economic growth could be secured, and secondly, that reaching and remaining in this policy corridor could essentially be achieved by the 'scientification' of policymaking.

In the political arena, conservative and neo-liberal criticism of the so-called excesses and the crisis of the welfare state quickly gathered momentum in the course of the 1970s, attracted electoral majorities and, in fast sequence, brought conservative governments into office, particularly in the United Kingdom (1979), the United States (1980) and West Germany (1982). In the face of such conservative 'regime shifts' in key countries, the stage seemed to have been set for not only pushing back the expansive Social Democratic welfare state and replacing it with a neo-liberal minimalist state, but also undoing the underlying policymaking model, including the advances of applied social sciences.

While leaving aside the question as to what extent key policies of the advanced welfare state of the 1960s have been dismantled under continuous budgetary pressures and replaced with a neo-liberal policy profile, it needs to be highlighted that, notwithstanding some early political irritations,[17] the incoming governments have largely continued to draw on and fund social science expertise and applied social science research, regardless of their political leanings and 'regime shifts'.[18]

Since the late 1970s, in some countries, including the UK under the Thatcher government, spending on policy evaluation was even increased in what has been called the 'second wave' of evaluation.[19] Since the late 1980s, the evaluation of the European Union's structural funding in member countries has risen to an astounding degree. While the underlying policy model, including its science-driven belief in and attempt at putting policymaking on a 'scientific' footing, has been certainly shattered since the mid-1970s, the governments continue to turn to social science advice and analysis, perhaps even more than ever before, under the current difficult socio-economic and budgetary context. So, Edward Shils' 1965 prediction that the integration of social science advice into the policy process was 'unlikely to be reversed' still stands.[20]

The cognitive agenda, however, of applied social science has changed significantly since the mid-1970s as illustrated by evaluation research and related approaches. While, in the reformist period of the 1960s, the mandate of evaluation research was chiefly to optimize the output and performance of a given policy programme or measure, it now serves to investigate the efficiency and effectiveness of a particular public policy with the implicit or explicit goal of reducing its costs, or terminating it altogether. As a result of the attempt to introduce private sector managerialist principles into public sector modernization, the emphasis on 'value for money' and managerialism have become, as in the case of the United Kingdom after 1979, guidelines for evaluation.

## CONCLUSION

After applied social science research emerged in the nineteenth century largely as a research commitment outside the sphere of universities, it became established as a university-based activity in the early decades of the twentieth century in America. Since the 1960s, applied social science has experienced an enormous international expansion, which has profoundly modified the institutional landscape of social science, including the role of university-based research as the hitherto prime locus of social science research. From the 1960s onward, four sectors can be distinguished in the field of social science research. First, universities remain the traditional centres of research; with studies financed primarily by major funding institutions. Yet these institutions are limited in their capacity to draw on the new 'government-commissioned research money market'. Second, in most countries private for-profit ('entrepreneurial') research and consultant organizations have grabbed the lion's share of the new commissioned research money market. In this context, we should also note the emergence of new hybrid-type research institutes established by researchers at the periphery of their academic institutions, in a somewhat precarious 'shadow zone' between non-profit and for-profit research. Third are governmental or quasi-governmental research institutes conducting research on behalf of the government. Fourth, social science-trained personnel within government bodies are commissioned to monitor research or to conduct analyses themselves, particularly in-house evaluations.

While the applied social science community has expanded on an unprecedented scale, it has undergone a differentiation and specialization along institution-specific, analytical focus-specific, and policy sector-specific lines. In the United States, this ongoing process of professional specialization is evidenced by the establishment of a wide spectrum of professional associations[21] and professional journals, whereas in Europe the process has been lagging.[22] As a consequence of this institution-, focus- and policy-specific differentiation and sectorialization, the discourse within the respective specialized communities tends to be largely limited to their specific issues and approaches, conducted in their particular pertinent policy community or issue community. Composed of the related researchers, research-commissioning agencies and programme managers or beneficiaries, such policy communities may serve as 'iron triangles' prone to conceptually and methodologically – including with regard to funding – 'perpetuate' a type of research along a fixed line.

Thus, the development of applied social science seems to have run into a paradox: while the potentially available research knowledge and 'societal intelligence' has been expanding at an unprecedented rate due to the continuously increasing research findings, the social science community has broken up into an increasing number of specialized and professional sub-communities reflecting a centrifugal rather than a centripetal tendency when synthesizing the interdisciplinary available body of social science knowledge. Meanwhile, the potential of applied social science to

significantly contribute to the theory building of the social science community at large tends to remain untapped.

It should be recalled, at this point, that the policy sciences, as advocated in the early 1950s by Harold Lasswell and his consorts,[23] set out to achieve the Herculean task of compiling the entire stock of available interdisciplinary social science data and of exploiting it in political and societal practice. Notwithstanding the enormous progress, the applied social science community with its diversified sub-communities and professional groupings has yet to realize Lasswell's vision of integrating and synthesizing potentially progressive societal intelligence.

### 'Epistemic drift' of (applied) social science towards the politico-administrative perspective, to the detriment of the 'societal intelligence'

University-based social science has been premised on three imperatives: first, academic autonomy in the selection of the subject matter and the methods of its research; second, independent funding, be it from university sources or through peer-review-based funding; and third, the presentation of the results of findings to open scientific debate and peer-review.

Particularly when commissioned and funded by government, applied social science research is liable to be challenged on all three premises: the subject matter, the leading questions and even the methods of its research pieces are often laid down by the governmental agency when commissioning the research; the government also provides the funding, thereby jeopardizing the researchers' autonomy; finally, the findings of commissioned research are often kept secret, or at least remain unpublished, thus bypassing open public debate and peer examination. Consequently, applied social science, particularly commissioned research, may succumb to 'a colonization process whereby the bureaucracies' perspective and conceptual framework',[24] may overtake it.

University-based social science research of applied orientation has also been criticized, particularly from within the discipline, as undergoing such 'colonization', since, especially in policy-related studies, the researcher may, perhaps unconsciously, be disposed to adopt the problem definition, cognitive frame and time-horizon of the researched subject in a political context and, thus, lose the analytical distance indispensable for truly scholarly work.[25]

The loss of cognitive autonomy and the absence of open debate on the methods and results of research entail the risk, from a normative social science perspective, of such research being conducted in a methodologically deficient manner and of falling prey to research institutes – sometimes nicknamed 'Beltway Bandits'[26] – that seek to extract a fast profit from research at the price of poor research standards and quality. But also seen from the perspective of the society's general interests and of enlightened political actors, methodologically sloppy and analytically policy-'obedient' research would seen of little or no value, as it will, at best, reproduce what the political actors already know. Instead, applied social science research that is institutionally enabled and intrinsically disposed to go beyond the often short-term policy frame of the political actors and the 'topical issues' at hand (to use Harold Lasswell's words) holds the promise of

analytically informing and educating on the long-term conditions, problems, and solutions of policymaking, thus contributing to the societal and political 'intelligence' at large.

### Applied social science and policymaking – a link 'unlikely to be reversed'

Leaving the important historical aspects of applied social science and their interface with its societal and political environment aside, the dramatic upsurge of applied social science in the 1960s was embedded in a science-driven model of policymaking based on the assumption that social science-generated knowledge (being *per se* superior to other societal sources of knowledge) was capable of guiding political decision-making, while pushing back, if not substituting, ideologies and interests at the core of the political logic of traditional policymaking. This belief in the 'scientification' of policymaking was most tellingly expressed in Donald Campbell's call for 'reforms as experiments'. For a brief period, it was apparently shared by significant members of the political as well as academic elites.

This belief in the 'scientification' of policymaking was shattered on two grounds. On the one hand, it was recognized that political logic, as distinct from scientific logic, remains deeply rooted in the political process, not only empirically in the real world of politics 'as it is' (which is unlikely to be fundamentally changed because of the innately political conflict between interests about 'who gets what, when, how'[27]), but also normatively, because replacing the political logic by a scientific one would run counter to basic normative principles of the democratic pluralist society and lead to scientific technocracy. While the optimistic belief in the 'scientification' of policymaking – epitomized in the temporary conduct of large-scale social experimentation – disappeared, there was a growing conviction and expectation that the socio-economic and political interests, when claiming to be considered in the policymaking process, need to publicly 'explain', if not empirically 'prove', their specific demands and expose them to the public debate and controversy.

On the other hand, it was understood that, apart from social science having been shown to be unable (vis-à-vis increasingly more complex and changing socio-economic, social and political environments) to produce the expected valid analyses and forecasts, the very epistemic foundation of social science – in terms of the underlying positivist model – came to be questioned along with the claims of the science-driven policy model. Inasmuch as social science research, however committed to objectivity and 'value-neutrality', is liable to be premised on normative, value-bound assumptions that guide the selection of research subject matter, hypotheses and methods, social scientists are bound to be mindful of their research findings being potentially biased by the normative framework of their research. In subscribing neither to the cognitive orthodoxy of positivism, on the one extreme, nor to cognitive relativism of constructivism, on the other,[28] but, instead, following the 'realist scientificism' proposed by Imre Lakatos, the scientific inquiry, in its 'quest for truth', can be seen as an ongoing process of approximation and validation towards the attainment of 'truth' through academic debate and controversy.

It is within this very controversy – in the world of politics, between rival actors and stakeholders, over the political legitimacy of their interests, and in the world of (social) science, between scientists, over the merits and validity of their findings – that the 'two worlds' of politics and science and their 'two logics' touch common ground. Being admitted to, or drawn into, the political and administrative arenas, applied social science has come to play a crucial role in policymaking, particularly in two regards. First, it has been significantly contributing to the pluralization of the political discourse and controversy in that social science-generated knowledge contributes to the information derived from other societal sources (such as interest groups) and competes with them for being listened to in the political process. Second, in abandoning the earlier idea of science-driven policymaking and of a per se ('epistemic') superiority of social science-generated knowledge, the communicative interface of politics and social science may be best captured by Jürgen Habermas' 'pragmatic' or 'dialogue' model in which politicians and social scientists talk and listen to each other in a mutual learning process. Inasmuch as the social scientists can be confident that their 'arguments'[29] – particularly those of the long-term, complex 'contextual' and not of the short-term, 'topical'[30] variety – find their way into the political and societal learning process, this may result in the 'scientification' of policymaking, in a process that is 'unlikely to be reversed'.

## NOTES

1. For a detailed account of this debate, see Wittrock et al. 1991, p. 28 ff.
2. See Maier 1965. The competency university students were expected to acquire is revealed in an administrative instruction of 1808 in Prussia according to which a student of the cameral sciences 'must have studied the state sciences and related disciplines, particularly policy sciences (*Polizeywissenschaften*), technology, statistics, experimental physics and chemistry, botany and economics' (quoted from Friedrich 1970, p. 36).
3. The state sciences, incidentally, made a great impression on the young American social scientists who, during that period, studied in great numbers at German universities. 'For them (to quote from Somit and Tanenhaus 1982, p. 8) *Staatswissenschaft* was like a breath of fresh, spring air (sic! HW). It was characterized by carefully defined concepts and a comparative, systematic, and highly professional analysis of data. In stark contrast to the ethically oriented, didactic political science of their undergraduate experience, *Staatswissenschaft* encouraged their belief that inquiry akin to that of the natural sciences could ultimately uncover the laws underlying political evolution and development.'
4. M. Bulmer, 'National Contexts for the Development of Social-policy Research: British and American Research on Poverty and Social Welfare Compared', in P. Wagner et al. (eds), *Social Science and Modern States*, Cambridge, UK, 1991, p. 161.
5. American Historical Association (1884), American Economic Association (1885), American Statistical Association (1988), American Academy of Political and Social Science (1889), American Sociological Society (1903), American Political Science Association (1903) (see Somit and Tanenhaus 1982, p. 22 f.).

6. As the noted contemporary German sociologist Karl Mannheim remarked, 'the typical problems of American sociology (arising) from the immediate necessities of everyday life. The American scholar is no bookish person; he maintains contact with criminal courts and social welfare institutions, lives with gangs, in slums and ghettos' (Mannheim 1932, p. 186 ff).
7. In Germany, for instance, prior to 1914, no university chairs in the sociology field existed and only few until 1933, while there was not a single chair in political science until 1933 (Wagner and Wollmann 1991, p. 62 ff.). Similarly, in the United Kingdom before 1945, sociology hardly existed as a distinct academic subject, while political science was mainly philosophical and institutionalist (Bulmer 1991, p. 152).
8. For a more detailed and a differentiating country-specific account, see Wittrock et al. 1991, Wagner 1991.
9. For Germany see Wagner and Wollmann 1991, pp. 69 ff., for Japan, Watanuki 1991, p. 223 ff.
10. See Ranney 1968. It should be noted that David Easton, who in the early 1950s had been a leading advocate of 'purely scientific', value-neutral behaviouralism, later emphatically revoked and reverted this earlier position: 'We can no longer take the ideal scientific stance of behaviourism that, because of the limitations of our understanding, application is premature and must await basic further research' (Easton 1969, pp. 1055–56).
11. For the 'New Jersey Negative Income Tax experiment', as an example, on which the research spending amounted to $8 million see Rossi and Lyall 1978.
12. R. A. Levine, 'Program, Evaluation, and Policy Analysis in Western Nations: An Overview', in R. A. Levine et al. (eds.), *Evaluation Research and Practice*, Beverly Hills and London, 1981, p. 46.
13. See Wittrock et al. 1991, p. 46 ff., Wagner and Wollmann 1996*b* for further accounts on country-specific developments.
14. The 'classic' methods book on evaluation was Campbell and Stanley 1963, both psychologists.
15. The literature on evaluation is virtually endless. For a comparative analysis on the development of evaluation, see Levine 1981, Levine et al. 1981, Wagner and Wollmann 1986*a*, Derlien 1991, for its methodological grounding see, as a 'classic', Campbell and Stanley 1968, for a recent brisk debate of the methodological problems of evaluation research see Pawson and Tilley 1997.
16. W. Jann, 'From policy analysis to political management: An outside look at public-policy training in the United States', in P. Wagner et al. (eds), op. cit., p. 114.
17. In the cases of the United Kingdom and of the United States, where the regime shift was ideologically striking, the Thatcher and Reagan governments, in perceiving the (applied) social scientists as being closely linked with the previous government, were at first set to 'punish' them by the reduction of funding. But these punitive steps turned out to be short-lived episodes.
18. For a comparative analysis as to whether 'regime shifts mattered' in the development of evaluation, see Wagner and Wollmann 1986*a*.
19. Specifically, on United Kingdom see Jenkins and Gray 1991, on West Germany see Wollmann 1989.
20. E. Shils, 'The Calling of Sociology', in T. Parsons and E. Shils (eds.), *Theories of Society*, New York. 1965.

21. See Operations Research Society of America (1952), Policy Studies Organization (1972), Association for Public Policy Analysis and Management (1979), Evaluation Research Society (1977) and Evaluation Network (1979), the latter to merged in the American Evaluation Association (1987).

22. In the field of evaluation, for instance, it was only recently that national associations were founded in the United Kingdom, Italy, Switzerland, and Germany.

23. H. D. Lasswell, 'The Policy Orientation', in D. Lerner and H. D. Lasswell (eds), *The Policy Sciences*, Stanford, CA, 1951, pp. 3–15.

24. A. Elzinga, 'Research, Bureaucracy and the Drift of Epistemic Criteria', in B. Wittrock and A. Elzinga (eds), *The University Research System*, Stockholm, 1985, p. 211.

25. For an example of such an intra-disciplinary debate between the 'traditionalists' and the policy researchers, see Wagner and Wollmann 1991, pp. 85 ff., Hartwich 1985.

26. H. C. Weiss and B. Wittrock, 'Summing Up: Social Sciences and Modern States', in P. Wagner et al. (eds), op. cit., p. 360. 'Beltway Bandits' refers to the highway around Washington, DC, where many of the private for-profit research organizations are located.

27. H. D. Lasswell, *Politics: Who gets what, when, how*, New York, 1936.

28. For this 'philosophy of science' debate see Wittrock 1991, pp. 344 ff., Pawson and Tilley 1997, pp. 17 ff., each with references; for a 'constructivist' argument see Rein and Schon 1991.

29. H. C. Weiss, 'Policy Research: Data Ideas, or Arguments?', in P. Wagner et al. (eds), op. cit., pp. 307–32.

30. H. D. Lasswell, 'The Policy Orientation', in D. Lerner and H. D. Lasswell (eds), op. cit., pp. 3–15.

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# PHILOSOPHY

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## INTRODUCTION

Science, technology and society have experienced tremendous changes in the twentieth century, a period in which humankind has made brilliant achievements in civilization and has been faced with multiple socio-cultural contradictions and crises. As a result, philosophy, which mirrors the spirit of the era, has also undergone profound transformation. Many newly emerged philosophical schools and theories offer a colourful panorama, reflecting the diversity of human culture.

In this chapter we will outline the basic patterns and characteristics of philosophy in the twentieth century: (1) A number of influential philosophical trends originating in Europe and the United States have brought forward a variety of distinctive philosophical doctrines and principal ideas by reflecting on science, culture and social life, while the various kinds of philosophy have also influenced one another to a certain degree; (2) the age-old and diverse regional and national philosophical traditions have maintained their vitality and renewed themselves in an effort to adapt to modern society and culture through contact with exotic philosophies; in addition, they have made important contributions to the development of world philosophy and culture; (3) the critical issues of universal significance posed by contemporary philosophy have determined the current role of philosophy in cultural and social development and foster an examination of the potential of philosophy and human civilization at the beginning of the new century.

## MAJOR PHILOSOPHICAL SCHOOLS OF THE TWENTIETH CENTURY

### Analytic philosophy

Analytic philosophy investigates problems such as facts and knowledge by means of linguistic and logical analyses. Its competition with the humanistic trend of the European continent is a prominent feature of twentieth-century philosophy. Analytic philosophy developed from realism's criticism of the speculative philosophy of Neo-Hegelianism

at the beginning of the twentieth century and is related historically to the philosophical traditions of Hume's empiricism and positivism. Modern logic, which developed during the century, provided it with a powerful thinking tool. The initial objective of analytic philosophy was the certitude of science and knowledge and the explicitness of language. In this respect, analytic philosophy benefited from the work of the German philosopher Gottlob Frege. He criticized psychologism, made distinctions between *Sinn* and *Bedeutung* (sense and denoting), set up the prepositional and predicate calculus system characterized by precise quantification of thinking, and emphasized that logic is the starting point and primary tool of philosophical studies, thus promoting the 'linguistic turn' in modern philosophy. British philosophers Bertrand Russell (Plate 103), George Edward Moore and the Austrian luminary Ludwig Wittgenstein were the actual founders of the analytic philosophy movement. By using his own comprehensive symbolic logic, Russell created the analytic method of the ideal language school and was well known for 'logical atomism.' His 'theory of description' is praised as a model of analytic philosophy. Moore stood for the restoration of realism, which confirms 'common sense', and sharply attacked idealism. He created the method of conceptual analysis of ordinary language. Wittgenstein advanced two different philosophical theories, which have exerted direct influence on both the ideal language and ordinary language schools. The representative work of his early philosophical theory is *Tractatus Logico-Philosophicus* (1921), in which he raised the 'picture theory', according to which language and the world have the same logical structure, and improved logical atomism with the truth function theory. Contrary to his early doctrine, his posthumous work *Philosophical Investigations* (1953) put forward the 'language game theory' concerning usage and rules of ordinary language and considered language as a 'life form.'

### Logical empiricism and philosophy of ordinary languages

In the 1920s, logical positivism (later called logical empiricism), as a representative ideal language school

represented by the Vienna Circle, brought the analytic philosophy movement to its climax. Principal members of this school were Moritz Schlick, Rudolf Carnap, Herbert Feigl, Otto Neurath, Friedrich Waismann, Hans Hahn, and Kurt Godel. Its inaugural manifesto was *Scientific Worldview: The Vienna Circle*. The Berlin school with Hans Reichenbach and Carl Gustav Hempel as the representatives and the Warsaw School represented by Alfred Tarski held views similar to those of the Vienna Circle. The philosophy of the Vienna Circle was later introduced into Britain by Alfred Jules Ayer, Frank Plumpton Ramsey and others, thus enabling logical empiricism to spread widely in the English-speaking world. It exerted great influence in the Nordic countries as well. Its basic ideas are: (1) strict distinctions should be drawn between analytic and synthetic propositions, and only these two propositions are meaningful and constitute scientific knowledge; therefore, all forms of metaphysics should be rejected; (2) the verifiability principle of prepositional meaning was set upon the basis of empirical reductionism; (3) philosophy is not science, but rather an activity of logical analysis of language that clarifies the meaning of propositions; (4) the advocated principle of physicalism is aimed at establishing a unified science system based on physical language.

The philosophy of ordinary languages was successively inspired by the thinking of Moore and later Wittgenstein; after the 1950s, the Cambridge and Oxford schools were its leading proponents. It objects to the re-creation of ideal artificial language and calls for removing confusion and misunderstanding in the use of language by traditional philosophies through careful analysis of the use of ordinary language. The 'theory of illocutionary force' created by John Langshaw Austin charted the developmental direction of pragmatics. The philosophy of ordinary languages maintains that analysis of languages is closely connected with human behavioural experience, and it can be extended into the ethical and socio-cultural fields without completely rejecting metaphysics. Peter Frederick Strawson created 'descriptive metaphysics' on the basis of his view of performative truth, and he emphasized the study of actual thinking structures in order to provide a conceptual framework for knowledge and ethics.

### Development of analytic philosophy in the United States

On the eve of the Second World War, some principal members of the Vienna Circle immigrated to the United States resulting in the rapid dissemination of logical empiricism, which gradually replaced the predominating pragmatism in that country. American pragmatist philosophy, founded by Charles Sanders Peirce and William James at the end of last century, infused various fields of the humanities and social science by John Dewey in the early part of the twentieth century and formed a complete theoretic system. Pragmatism emphasizes the continuity and entirety of experience and holds that pluralistic and relative truth is a useful instrument for dealing with the environment. Its empiricism and behaviourism are different from logical empiricism, but at the same time, both have infiltrated and interacted on each other. Moreover, logical empiricism significantly enriched logical analysis in the United States. The studies conducted on rationality of

science by Reichenbach, Hempel, and others promoted the development of the philosophy of science.

Since the 1950s, logical empiricism has been gradually declining due to challenges from within and without analytic philosophy and its intrinsic theoretic difficulties. In Britain, it was attacked by Karl Raimund Popper's critical rationalism and falsifiability doctrine. In the United States, Willard van Orman Quine criticized the two dogmas of empiricism – the strict distinction between analytic and synthetic truth and the reductionism of the verification of meaning – and put forth the principle of ontological commitment and naturalistic philosophy of language, thus turning analytic philosophy towards logical pragmatism. He also established the holism of scientific knowledge and the doctrine of ontological relativity. His breakthrough in the basic theoretical framework of logical empiricism has led to the advancement of American post-analytic philosophy and philosophy of science in diverse forms, including the theories concerning the meaning of truth and its interpretations and anomalous monism by Donald Herbert Davidson, essentialism and the possible world doctrine by Saul Kripke, the speech act theory by John R. Searle, internal realism by Hilary Putnam, the historicism on structure of scientific revolution and the paradigm theory by Thomas Samuel Kuhn, pluralism by Paul Karl Feyerabend and neo-historicism by Dudley Shapere. Richard McKay Rorty's neo-pragmatism and the doctrine on culture of post-philosophy represent a radical rebellion against traditions of analytic philosophy and an attempt to merge scientism and the humanistic trends on the European continent.

### Phenomenology and phenomenological movement

Phenomenology is an important philosophical trend that studies human acts of consciousness and stresses the analysis of consciousness, namely, the description of phenomena. It has had a far-reaching impact on the development of philosophy on the European continent in the twentieth century, and its methods of phenomenological description have been put to use in various degrees by other schools such as existentialism, philosophical hermeneutics, and philosophical anthropology. Such applications are collectively regarded as a broad-sense phenomenological movement, which lasted through the century.

### Husserl's phenomenology

The aim of phenomenology, founded by Edmund Husserl, was to determine the definite, necessary and absolute foundation for knowledge. He called for the 'return to things themselves' and stood for an attitude of 'epoché' in making judgements on the existence of the world. This attitude involves describing and reflecting on every phenomenon appearing in the consciousness of the empirical self by essential intuition; probing the meaning and structure of empirical knowledge; studying in depth the intentional structure of transcendental ego and its acts of constructing conscious objects by eidetic reduction and transcendental reduction so as to establish a kind of strict theory of knowledge; and obtaining phenomenological residuum in transcendental reduction, which is pure consciousness, i.e. transcendental ego as the subject of transcendental

phenomenology and the ultimate basis of all knowledge. In his later years, Husserl advanced the *Lebenswelt* (life-world) theory, which holds that according to a teleological explanation of history and owing to the long-standing influential role of positivism and objectivism, European science in the twentieth century lost human subjectivity and the meaning of life. This in turn enabled irrationalism to penetrate science, contributing to an overall crisis of humanity. He believed that philosophy should probe the human life to re-establish a rational basis for the meaning and value of science and life. This doctrine has exerted profound influence on humanistic philosophy in contemporary Europe.

## Existentialism and psychoanalysis

Existentialism finds its theoretic source in the irrationalism of Søren Aabye Kierkegaard and Friedrich Wilhelm Nietzsche in the middle and late nineteenth century and Husserl's method of phenomenology. Its aim is to reveal the authentic existence of human beings and to explore the structure and meaning of human existence. It originated in Germany in the 1920s, became prevalent in France during and after the Second World War, and later spread to other countries. Its main representatives are the German philosophers Martin Heidegger and Karl Jaspers and French philosopher Jean-Paul Sartre (Plate 104). Heidegger, one of Husserl's pupils, deviated from his teacher's theoretic orientation. He pioneered studies focusing on the existence of human beings and elaborated a completely new notion of *Sein* (being). In his most important book, *Being and Time (Sein und Zeit)*, published in 1927, Heidegger criticized traditional ontology and formulated his fundamental ontology, which probes into the meaning of 'being' and 'being-there' (*Dasein*) by means of phenomenology and emphasizes the realization of human existence through understanding the meaning of 'being.' He also pointed out that contemporary human beings are facing a crisis because they have lost the meaning of their own 'being' by conquering and controlling external things. In his later works, such as *Letter on Humanism* (*Über den Humanismus*, 1947), *Forest Trails* (*Holzwege*, 1949) and *The Way to Language* (*Unterwegs zur Sprache*, 1959), Heidegger expounded some key ideas: truth is the 'unconcealedness' of the meaning of 'being', language is the 'home of being' and basic mode of human existence. He also criticized cybernetic consciousness and technological civilization with a non-anthropocentric view.

Jaspers was a theological existentialist. In *Philosophy* (*Philosophie*, 1932), *Philosophical Faith and Revelation* (*Der philosophische Glaube angesichts der Offenbarung*, 1962) and other works, he maintained that existence is freedom and that having discovered the limits of their own marginal existence, human beings could approach the transcendental God. In *Being and Nothingness* (*L'Etre et le Néant*, 1943), *Critique of Dialectical Reason* (*Critique de la raison dialectique*, 1960), and other works, Sartre stressed that the core of existential philosophy is humanism and expounded the principle of 'being preceding essence'. He examined the dialectical relationship between 'being-in-itself' and 'being-for-itself' and between the individual and society and also advocated free choice and assuming responsibility for one's choices. He tried to replenish the human aspects of Marxism

with existentialism. Sartre's philosophical thought was immensely influential because of his literary works and his participation in leftist political activities.

Psychoanalysis, pioneered by Sigmund Freud in the early twentieth century, attempts to discover the secrets of human beings' irrational mental state of unconsciousness. Freud considered the human instincts of self-preservation and sexual desire to be the innate driving force behind human behaviour and the suppression of 'libido' (sexual desire and love) as the root cause of mental illnesses. Moreover, according to Freud, the creativity of human consciousness is able to turn the suppressed instincts into a spiritual force, which is the cornerstone of human evolution and civilization. Neo-Freudians Carl Gustav Jung and others later conducted studies on collective unconsciousness and used a kind of social psychoanalysis to explain social and cultural processes. Psychoanalysis has had a considerable influence on the phenomenological movement and other contemporary philosophical schools.

## Contemporary philosophical hermeneutics

The term *hermeneutics*, which probably derived from Hermes, the messenger of the Greek gods, originally referred to the interpretation of divine commands, but eventually came to refer to a methodology of the humanities. Heidegger's expounding on understanding and language as the basic modes of human existence brought about a shift in hermeneutics, which was henceforth considered in an ontological context. Hans-Georg Gadamer, Heidegger's pupil, has since 1960 published a series of works including *Truth and Method (Wahrheit und Methode)*, thus establishing philosophical hermeneutics as existential ontology. Among the main concepts: as the essential attribute of being, understanding integrates judgement, history and language, thus turning Heidegger's truth as 'unconcealedness' into the main thrust of hermeneutics; understanding, in a historic sense, is considered the dialectical interaction of prejudice and tradition, which have evolved in creative activities to form a consciousness of history. Language is the central issue of philosophy, and by absorbing and transforming the 'language game theory', the existential ontology maintains that the linguistic universality of world experience constitutes a form of life although it possesses ontological priority. French philosopher Paul Ricoeur, in his works including *Le conflit des interprétations*, 1969, and *Hermeneutics and the Human Sciences*, 1981, created phenomenological hermeneutics that merge with structuralist semiology, psychoanalysis and the speech act theory. He maintains that the doctrine on the life-world, transcendental phenomenology and existential ontology can be connected, but cognitive links must be added, and this can be achieved by the analysis of semantical structure of text, which is the focus of hermeneutics. Contemporary philosophical hermeneutics has been widely circulated and studied in Europe, the United States, and other countries.

## Structuralism and post-structuralism

Structuralism originated from the theory of structural linguistics. It is a philosophical trend, which applies the method of structural analysis to the study of social, historical

and cultural phenomena and has been prevalent on the European continent since the 1950s alongside phenomenology and existentialism. Switzerland's Ferdinand de Saussure was the pioneer of structuralism, and in the 1950s the renowned French cultural anthropologist Claude Lévi-Strauss (Plate 105) used modes of structural analysis to study socio-cultural phenomena.

## Early structuralism

In his books, *Structural Anthropology* (*Anthropologie structurale*, 1958), *The Savage Mind* (*La pensée sauvage*, 1962) and the four-volume *Mythologiques* (1964–71), Lévi-Strauss treats all forms of human social acts as cultural phenomena with the properties of linguistic codes. He uses modes of linguistic structural analysis to investigate social structures and cultures of the primitive society, and thus expounds the philosophical theory of structuralism. He conducted studies on marriage and the family system of the primitive society and maintained that social structures and cultural phenomena result from the innate structuring ability of the unconscious in the depths of the human mind. The unconscious is not the irrational instinctive impulse described by Freud, but an intellectual function that exists inherently in the entire human race for constructing conscious cultural phenomena and enables human beings to maintain structures at both the natural and cultural levels. Lévi-Strauss advocated that the task of structural anthropology is to investigate, through people's conscious activities, the integral structure of the unconscious playing a role of conditionality in society and culture, thus rendering studies of social sciences and the humanities as precise as those of natural sciences.

In the 1950s, Swiss psychologist and philosopher Jean Piaget began publishing his three-volume book *Introduction to Genetic Epistemology (Introduction à l'épistémologie génétique)*, in which he studied the origins and the development process and structure of cognition by using structural analysis. He defined *structure* as a dynamic conservation system with integrality, which consists of a number of transformation rules and is capable of self-regulation. He explained that cognition originates from interaction between the subject and object and is in itself a creative constructive process encompassing simple low-level structure to complex high-level structure. Through the homeostasis action of assimilation and accommodation, the subject's cognition patterns are able to gradually approach the structure of the object. And such a constructing process is infinite.

## Post-structuralism

Post-structuralism, while criticizing traditional metaphysics, opposes the ideas of fixed structures and structure centres. As one of its representatives, French philosopher Jacques Derrida established the theory of deconstruction in a series of works including *Of Grammatology (De la grammatologie, 1967), Dissemination (La dissémination, 1972)*, and *The Margins of Philosophy (Marges de la philosophie, 1972)*. He pointed out that the error of 'logocentrism' ran through various kinds of metaphysics and the fact that structuralism is centred on the phonetic actually also falls under the tradition of metaphysics. He held that it is necessary to deconstruct all philosophical systems with structural centres and remove all their socio-cultural sediments and emphasized that the written language, namely the visual letter symbols in space, is superior to the spoken language. The difference between linguistic symbols, according to Derrida, should be a kind of diachronic 'différance' (temporal difference) which is dynamically displayed in 'the experience of life' described by phenomenology. The meaning of language is a 'trace', which can be erased and renewed incessantly, and all written language is the inscription of the trace. Derrida's theory of deconstruction deals extensively with literature, art, and socio-cultural issues, and it has thus exerted an impact particularly on literary and aesthetic theories in Europe and the United States.

## Diversity of structuralism

Structuralism boasts some other influential and distinctive theories. French philosopher Jacques Lacan transformed psychoanalysis with structuralism and believed that unconsciousness possesses a linguistic structure and that Freud's theory of unconsciousness can be re-described in precise terms by the rule of signifier and applied to the humanities in a more flexible and effective way. He maintained that the unconscious is formed in exchanges between the subject and the other (others, and especially via language). Therefore, the unconscious is the discourse of the other and its linguistic structure is the common psychic structure of people. Michel Foucault, another influential French philosopher, studied psychiatry, the history of ideas and socio-cultural issues by unique methods in a number of his books including *The Order of Things (Les mots et les choses*, 1966), thus setting up a theory of discourse and 'archaeology of knowledge'. He held the view that all things and human behaviours depend on the link between words as the internal structure and things as the external phenomenon, their structure in the space of knowledge being 'epitome.' Although the three types of 'epitome' experienced by intelligence and culture in Europe since the Renaissance have their respective principles for organizing knowledge, they are all anthropocentric. The task of contemporary humanities is to create, by analysing human exploration into the nature of life and labour, an epitome which does not take human beings as the central subject but describes only the order of discourse, confirms the unity of rationality and irrationality, and believes in accidental sudden change in epitome and non-continuity of history, thus transforming studies on the history of civilization into a kind of 'archaeology of knowledge.'

Noam Chomsky in the United States produced the theory of transformational-generative grammar. He expounded the surface and inner structures of language and a whole set of rule systems for their creation and transformation. His theory is praised as a revolution of contemporary theoretical linguistics and can be applied to many fields. His universal or philosophical grammar is based on the philosophy of the mind, which combines rationalism and biologic naturalism. It holds that innate linguistic competence and structure are the mirrors reflecting the inherent capability and structure of the human mind, and they are thus genetically inherent in the human brain.

## Marxist philosophy

Born in the mid-nineteenth century, Marxist philosophy has been a developing current with enduring vitality and extensive influence throughout the twentieth century. It persists in the world views of dialectical materialism and historical materialism, stresses practice as the source and basis of knowledge and the criterion for testifying truth, asserts that social being determines social consciousness, and explains all historical phenomena in the light of economics and socio-political relationships. Marxist theory has developed by continuously accumulating the achievements of natural and social knowledge. As a theoretical force of transforming the world, Marxist philosophy has promoted the socialist revolution in a number of countries and become the leading theory in their social ideology. Meanwhile, some thinkers in Europe and the United States have studied, revised and 'enriched' Marxist philosophy in various ways. They have merged it with ideas from other philosophical schools and conducted new critical studies on the social process of contemporary capitalism, resulting in a number of doctrines of so-called 'Western Marxism'.

## Development of Marxist philosophy in socialist countries

G.V. Plekhanov effectively disseminated Marxist philosophy in Russia and made a new contribution to studies on the social structure with historical materialism. Lenin further developed the basic principles of Marxism. He studied the new discoveries and theoretic crisis of natural sciences at the beginning of the century, advanced scientific materialism and reflectionism while expounding the fundamental categories of matter, experience, truth and practice, and put forward the idea of unity between dialectics, logic and epistemology in carrying out in-depth studies on the basic laws and categories of materialistic dialectics. He developed the Marxist doctrine on state, explored the socio-economic structure for the socialist transition period, including the necessity to resort to means such as 'state capitalism', and revealed the special law of the socialist cultural construction, which he claimed must critically inherit and carry forward the fine traditions and achievements of world culture. However, Stalin made some dogmatic interpretations of Marxist philosophy and false assertions on the social reality, which exerted a negative influence upon the socialist cause. Taking into account the particularities of the Chinese revolution and construction, Mao Zedong creatively adapted Marxist philosophy to the Chinese context, by 'seeking truth from facts.' In criticizing dogmatism, he founded the doctrine based on practice and contradiction. He stressed the utmost importance of practice in the active and dialectical epistemology, carried out in-depth studies on the law of unity of opposites, the core of materialistic dialectics. His theory concerning the correct handling of internal contradictions among the people explored basic contradictions in socialist society and the principles for dealing with different kinds of contradiction. His philosophical thinking continues to play a leading role in building a Chinese variety of socialism. Philosophers in socialist countries have been working to absorb the new experience of social practice and new achievements of science-technology and culture while attaching importance to dialogue with their counterparts in other countries in an effort to enrich and develop Marxist philosophy in various branches and fields of knowledge, thus making it a precise and open theoretic system.

## Humanistic philosophy of praxis

The *Prison Notebooks* (*Appunti*, 1929–35) written by Italian social theorist Antonio Gramsci during his incarceration by the fascist regime deals extensively with numerous philosophical, historical, political and cultural issues. He advanced the notion of praxis (action) and in accordance with historicism's 'principle of totality', he maintained that the subject and object, and theory and practice are unified in people's social and spiritual activities. He objected to mechanical determinism in economy and believed social history to be a process in which the economic basis, social politics, and ideology interact in a dialectical way. He criticized capitalist society's control over ideology and culture, called for socialist democracy, stressed the important role of ideology and social culture in the revolutionary struggle and urged intellectuals to form a historic alliance with the masses to establish a new cultural system leading to human liberation and a renewed morality.

In *History and Class Consciousness* (1923) and other works, Hungarian philosopher György Lukacs stressed *praxis* as the central philosophical concept in conformity with the principle of totality and regarded alienation as the main basis for criticizing capitalism. He maintained that the proletariat must acquire a class consciousness of the search for totality, overcome alienation and undertake its own (and humankind's) liberation through activities capable of reforming history. As a result, history also acquires self-consciousness. Lukacs also applied his philosophy to aesthetics and to art and literary theory. His philosophy has had tremendous influence on the theories of 'Western Marxism' and the humanistic trends within the socialist movement.

## Critical theory of society in the Frankfurt school

The Frankfurt school was the most influential and long-lived of the diverse currents of 'Western Marxism'. Established in 1923 as the Institute of Social Research, its main advocates were Max Horkheimer, Herbert Marcuse, Theodor W. Adorno, Jürgen Habermas, and Alfred Schmidt. In 1934, the Institute was relocated to the United States and remained there until 1950, when it returned to Germany. After the 1970s, it ceased to exist as a unified school owing to major divergences among its members.

In its early days, its members denounced fascist dictatorship as the destruction of rationality. However, they later conducted studies primarily on the characteristics and crises of the developed industrial society and contemporary capitalism, which led to their critical theory of society. They claimed that they accepted some of Marx's principles, including the doctrine on alienated labour, to criticize capitalism. Moreover, certain ideas borrowed from existentialism, psychoanalysis, philosophy of ordinary languages and philosophical hermeneutics infiltrated their theory. They criticized technocracy, human alienation and

extracted ideology from the fields of economics, politics and culture. *Dialectics of Enlightenment* by Horkheimer and Adorno presented the 'traditional theory' based on instrumental rationality, which had led to the negative effects of the technological civilization on human beings. Marcuse pointed out that the developed industrial society is a technocratic one-dimensional society, which produces one-dimensional thinking to control ideology. According to Marcuse, one-dimensional man loses his ability to reason and is ultimately reduced to being a slave to material things.

Habermas advanced the theory of 'communication rationality' and attempted to eliminate the 'legislation crisis', reform the social structure, and advocated a lifestyle based on a free communication structure. According to the Frankfurt School, in the contemporary industrial society with its highly developed science and technology, class structure has undergone major changes and the state should play a leading role in social intervention. It further maintains that the transformation of the society should focus primarily on the field of ideology.

## NATIONAL AND CULTURAL PHILOSOPHICAL TRADITIONS

### Indian philosophy

In the twentieth century, Indian philosophy converged with Western philosophy mainly in the areas of analytic philosophy and the phenomenological and existential currents of thought. Many great philosophers in modern India, including Rabindranath Tagore (Plate 106), Mohandas K. Gandhi, Aurobindo Ghose, Krishnachandra Bhattacharya and Sarvepalli Radhakrishnan, were not only well versed in traditional Indian philosophy, but also possessed a good understanding of the philosophies and cultures of Europe and the United States. Most of them were aware of the numerous 'scientific facts' and empirical methods in the modern world and attempted to explain their own traditions from a new perspective. Some of them even returned to traditions after in-depth studies in Western sciences, believing that the principles of traditional Indian philosophy are in some ways linked to those of the other philosophical schools.

Traditional Indian philosophy has its roots in the ancient religious ideas described in the Upanishads and seeks a supernatural value or the value of the other world by adopting a meditative and superrational attitude. Influenced by this Vedantic tradition, modern Indian philosophy is basically monistic; however, under the impact of Western thinking, Indian religious philosophy has acquired secular aspects. Radhakrishnan, as the principal interpreter of a reconstructed *Advaita*, believed that when 'reality' relates to itself or is regarded as an infinite possibility, it is the 'absolute' objective sought after by philosophy, yet when 'reality' relates to creation or to the possibilities lying within forms of creation, the 'absolute' becomes the creator, wisdom, love, good and the god, as the goal of religion. Some Indian philosophers maintain that although the god can exist without the world, it is nonetheless real because it is determined by the will of the god, thereby proving its existence. It follows that man and the empirical world of his subsistence are closely related with the transcendental reality, and the developmental order of corporeality is not

mechanical, but seeks to realize a particular goal. Therefore, repression of the corporeal nature would destroy the supreme spiritual reality. While trying to redefine Vedantic ideas, Ghose pointed out that only in corporeality can ego develop and interrelate with 'the universal beings' or the ego of all other individuals and can human consciousness and existence continuously grow and develop until they eventually reveal their identity with the god. As a result of this change in their basic position, modern Indian philosophers no longer pay attention only to the transcendental field to the neglect of experience and rejection of secular considerations. They reconcile the two and call for training human beings, by means of philosophy and adopting a new attitude towards living and observing the world. They believe that once people understand through the acquisition of philosophical knowledge that they are unified with all other things, their disposition will immediately change. They have given modern explanations to a number of key concepts of Indian philosophy, such as *karma*, *rebirth*, *eternal life*, and *deliverance*. Ghose and others explain *karma* from an existentialist perspective: this obstacle to our own freedom is created by ourselves and although we are indeed restricted by *karma*, we are also able to create a future and realize full freedom after the obstacle is removed.

Tagore and Radhakrishnan analysed various situations in the realm of human existence – life's suffering, anxieties and fears – and asserted that human beings will obtain the true meaning of life if they live in them and do not complain about them. Gandhi maintained a philosophy of non-violence. He repudiated violence as the law of brutes, because it causes pain to any life as a result of anger or selfishness. Gandhi praised non-violence as the law of our species because the basic principles of non-violence are based on the principle that what is good for oneself is good for the entire universe as well. He explained that non-violence did not mean surrendering to evil; neither does it mean compromising with violence. This activist interpretation of non-violence greatly enriched the Indian notions of quietism and negation. While ancient Indian philosophy concentrated solely on living to escape reality, modern Indian philosophers stress the connection between philosophy and the secular life. Modern Indian philosophy maintains that philosophy is able to foster a world view, and therefore, it contains both highly rational analysis and positive inspirations for behaviour and lifestyle.

In the epistemological field, modern Indian philosophers have been influenced by Western theories of knowledge as well as their own traditions. However, most of them are unable to totally accept methodology dominated by Western scientific reasoning, and they stress that we eventually must grasp reality by understanding the *supermind* and *superself*, even though they admit that sensory experience and rational cognition can be useful as sources of knowledge about life. Radhakrishnan pointed out that rational thinking takes the duality of the subject and object as its premise and that to understand the monistic reality, this cognitive process separating the subject and object of cognition cannot be used. Bhattacharya noted however that 'cognition' has never been a passive state, but rather an activity displaying the subject's free association with the object; it can thus be inferred that science is not cognition because it always cuts its ties with the subject and stresses only factuality and objectivity. Some other modern philosophers, influenced by

Henri Bergson, no longer regard intuition as a kind of mystical capability, but treat it as perfect types of mental activities, which are able to extend and deepen the process of perception to areas not accessible to sensory organs. In intuitive comprehension, the difference between the subject and object disappears as their duality vanishes.

## Chinese philosophy

In 1911, the last Chinese feudal dynasty was overthrown, and in February 1912 a republic was established. Philosophy in twentieth-century China has witnessed a process of fusion or dialogue between modern Western philosophy and China's traditional philosophy. Western philosophy was first introduced to China in 1897 with the translation of Huxley's *Evolution and Ethics*, which was rapidly followed by the translation of the works of Spencer, Darwin and others. At the turn of the century, the writings of Schopenhauer, Kant, Nietzsche and Rousseau appeared in China. In the following decade, important works by Bacon, Descartes, Spinoza, Berkeley, Hume, James, Bergson, Russell, Dewey, Marx, Bakunin, and Kropotkin (the advocate of the philosophy of anarchism) were available in China. As interest grew, Dewey was invited to lecture in 1919 and 1920 and Russell in the following year; each school had its champions and detractors among Chinese thinkers.

Some of the Western thought heavily influenced the 1911 revolution and the New Culture Movement. For example, Sun Yat-sen (Plate 107), the leader of the 1911 revolution, was an exponent of Darwinism. His ideas of *Tienhsia Weigong* (the world belongs to its people) and *Tienhsia Datong* (the great unity of the world) were obviously a fusion of evolutionism and Confucianism. Hu Shi, a pupil of Dewey and one of the initiators of the New Culture Movement, faithfully followed Dewey in the conviction that truth is an instrument to cope with actual situations, and he advocated 'more investigation of problems and less talk about theories'. Li Dazhao, the co-founder of the New Culture Movement, first introduced Marxism to the Chinese youth and greatly promoted the movement.

Marx's materialistic interpretation of history became a fashion in the late 1920s, and after the mid-century it became the mainstream philosophy in China. As an open system, Marxism has incorporated China's local context and the positive aspects of traditional Chinese philosophy as well as certain great achievements of foreign civilizations. In the early twentieth century, traditional Chinese philosophy, comprising mainly Confucianism, Buddhism and Taoism, also renewed its content and form through encounters with Western philosophy. After conducting thorough comparative studies on Oriental and Occidental philosophies, a number of scholars well-versed in both Confucianist and Western philosophy expressed the view that since Western thinking had shortcomings, it should not be adopted without making changes to it. They founded a variety of modern Neo-Confucianism based on traditional philosophy integrated with suitable aspects of Western culture and philosophy.

Assimilating Bergson's philosophy of life, Liang Suming established his own Neo-Confucianism. His lectures on 'the Civilization of the Orient and Occident and their Philosophies' drew widespread attention. His variety of Neo-Confucianism stresses that the Chinese ideal of the 'mean' (the harmonizing of passions) contrasts markedly with Western and Indian philosophy. Xiong Shili founded the 'new doctrine of consciousness only'. In fact, his philosophy is a combination of Buddhist idealism, Wang Yangming's mentalism, and Bergson's theory. Many philosophical terms he used came either from *The Book of Changes* or the Buddhist 'consciousness only' school, while some of his basic philosophical concepts, such as 'the unity of substance and function' and 'the primacy of the original mind,' originated from the Neo-Confucianism of the Song and Ming dynasties. His philosophy avoids both Zhu Xi's dichotomy of the principle and material force as well as Wang Yangming's subordination of material force to the mind, thus injecting a view of dynamic change into Neo-Confucianism. Feng Youlan, who studied philosophy at Columbia University in New York, set up the new rationalistic Confucianism, which converts Confucianist philosophical concepts into formal logical ones. Merging Western realism and logic, Taoist negativism and transcendentalism, he claimed that the theoretic pillars of his philosophy are the four basic metaphysical categories: (1) 'Principle', which belongs in the realm of reality; (2) Material force, the basis of the concept of existence; (3) Tao, which is a universal operation and a regularly improving and changing universe; and (4) the Great Whole, where one is all and all is one and which constitutes the transcendent supreme reality. He Lin made outstanding contributions to the spread and study of Western philosophy, particularly Hegelianism, in China. Between the 1930s and 1940s, he put forward a program of Neo-Confucianism in which he stressed the necessity to reform traditional Confucianism by absorbing the positive elements of Western philosophy and culture so as to meet the modern challenge of reviving the national culture. He advanced the theory of subject as the 'logical mind', called for the integration of cognition, morality, and aesthetic sentiment into the logical subject, and the dynamic unification of knowing and practice.

The above-mentioned modern Neo-Confucianism displays the following three obvious theoretic characteristics: (1) it persists in the theory of holism and monism in traditional Chinese philosophy in an effort to counter dualism in Western and Buddhist philosophy; (2) it develops the intuitive cognition of traditional Chinese philosophy and stresses the importance of intuition and cognition; (3) it views human nature and life as part of a fluid and evolving reality, a flux. Therefore, the ethical codes and moral principles in traditional Confucianism should also be revised and adjusted to enable human beings to continuously improve their inner spiritual life to be prepared for the challenges from the outside world and modern social life.

In the latter half of the twentieth century, many Chinese philosophers have comprehensively and systematically studied traditional Chinese philosophy including Confucianism, Taoism, Buddhism and other schools of thought in accordance with Marxist views. Hou Wailu, who had largely contributed to the spread of Marxism in China with his translation of Marx's *Das Kapital*, published his five-volume work *The History of Chinese Ideas* (in collaboration with Du Guoyang), which is often praised as an outstanding application of Marxism to Chinese philosophy. The authors have judiciously selected the

essence of traditional philosophy. They have also concentrated on studies in two important areas. Firstly, they have studied the relationships between traditional Chinese philosophy and modernity in an effort to explore the best way to advance traditional Chinese philosophy, and to constructively integrate it into the modern socialist cultural system. Secondly, they have conducted comparative studies between traditional Chinese and foreign philosophy to explore the significance and value of Chinese philosophy from the broad perspective of world civilization.

## Japanese philosophy

Since 1914, Japanese philosophy has been developing in two different but intertwined directions. The first tendency came from the attitude espoused by Tokyo University, which very early attempted to ponder over questions in the context of the European experience. This school of thought was mainly represented by Tetsujiro Inoue. His successor, Genyoku Kuwaki, conducted numerous studies on Kant, and under his encouragement, Neo-Kantianism spread widely and exerted great influence during the rule of the Taisho regime (1912–26). In addition, Husserl's phenomenology was introduced in Japan as early as 1921. The second tendency was advocated by Kyoto University under the guidance of Nishida Kitaro (Plate 108). It attempted to develop a Japanese philosophy based on Japan's own experience rather than the European model. The Tokyo school thoroughly studied the philosophic thought of the European continent as its primary task, while the Kyoto school attempted to absorb European philosophy by referring to Japan's own historical experience. It is particularly worth noting that Nishida possessed a profound knowledge of Chinese culture particularly regarding pre-Qing Dynasty Confucianism, Zhuang Zi's thinking and Wang Yangming's doctrine. In a study of the good, Nishida strove for a 'logic of field'. The Oriental logic he created borrowed Wang Yangming's idea of the 'unity of knowing and doing' and the Confucianist doctrine of the 'Mean'. According to this logic, 'good' means not only the satisfaction of a certain need at a certain time, but also harmony between various activities. Nishida's theories merge oriental and occidental philosophies to form the structure of the 'Nishida philosophy'.

In addition to the two major philosophical schools mentioned above, there also existed the Kyoto School led by Hajime Tanabe. Tanabe was an outstanding expert in the philosophy of mathematics and science and renowned for his studies on 'logic of the species'. The species in question refers to the nation, which lies between individuals and humankind and connects the two. After the Second World War, Tanabe was the leader of a group of intellectuals who urged a thorough housecleaning of theories on ultra-nationalism. The second most active philosophical school after the war has been Marxist philosophy, introduced to Japan by Sen Katayama in 1903, and by Hajime Kawakami in 1922. The most active advocates of Marxism after the war were Kiyoshi Miki and Jun Tosaka. These Marxist thinkers had been the principal opponents of the tide of pre-war ultra-nationalism. But in the 10 years immediately after the war, the force of Marxist philosophy burgeoned through academic publications and conferences. The third major philosophical school is existentialism,

which explored all of the movement's proponents from Heidegger and Jaspers to Sartre and Gabriel Marcel. Its main representative, Goichi Miyake, is renowned for his studies on Heidegger. Pragmatism is the fourth active philosophical school to develop after the war, owing to the activities of the Association for the Study of American Philosophy, its prominent exponent being Seiji Ueda, a scholar of longstanding authority on Anglo-American thought in the early 1950s.

## Islamic philosophy

Islamic philosophy is actually the collective achievement of a number of peoples including Arabs, Berbers, and Indians. It developed with the rise of Islam, which endowed it with a highly coherent world view. Islamic philosophy took shape in the mid-eighth century and later witnessed rapid development and dissemination under the influence of Greek thinking. The numerous studies on Greek philosophy and culture by Arab scholars greatly influenced the European Renaissance. According to Islamic philosophy, the status of humankind must be enhanced by its infinite power of reason. Consequently humankind does not have to rely on any supernatural force to find salvation. Islamic philosophy recognizes the dual truth of reason and revelation and maintains that human beings live in both the spiritual and earthly spheres, and they may enjoy the right to secular life in accordance with the Koran. In the twentieth century, while influenced by Western philosophical and cultural traditions, Islamic philosophy has maintained its own theoretic integrity, stability and critical capability and played an important role in religious and social life.

Indian Muslim philosopher Muhammed Iqbal studied Western philosophy, especially the works of Hegel, Whitehead and Bergson, and reinterpreted Islamic philosophy using modern philosophical concepts. He considered religion the manifestation of human beings' integrity and a key component of the 'reality' on which the philosopher reflects. The concept of the concrete world embodied in the Koran refers to a created reality, characterized by a rational mode of integrating truth and idealization. However, the world is neither a stagnant universe nor the ultimate product of Allah, but rather a universe achieving continual self-realization in time and space. And human beings, as the most active force in the universe, serve as Allah's main agent in the process of realizing the infinite potential of 'reality'. Religious experience has extrinsic, intrinsic and mystic characteristics, thus enabling human beings to continuously reveal the complex facets of their own reality. Moreover, reality can be verified not only through experience but also by philosophical speculation. Iqbal incorporated some ideas from Western philosophy and science. He rejected the hypotheses of material reality and gave a new explanation to atomism by using the term *monadology* or *spiritual pluralism*. He believed that every molecule or element is spiritual and possesses an ego and that the higher the level of ego or consciousness the greater its reality and the closer it is to Allah. The spiritual ego, as an individual and eternal soul, is the core of the spiritual state or emotion, while a limited ego is only one aspect of the ultimate ego inherent in nature.

Like Iqbal, Muslim philosophers such as Al-Afghani, M. 'Abdu and Ameer Ali maintained Islamic views on life

despite the fact that they were influenced by Western philosophy. Sayyid Qutb, an Egyptian thinker and activist pointed out in *Islam and the Problems of Civilization* (1963) that the comprehensive Islamic way of life can save modern man. Muhammad Al-Bahi espoused even more radical views. In *Islamic Thought and its Relation to Western Imperialism*, he claimed that Western civilization has failed to solve contemporary problems primarily because of its misuse of the medieval scientific spirit in the fields of industry, technology, economy and biology. Egyptian philosopher Abbas Mahmud al-Aqqad took a relatively moderate attitude and criticized those rationalists who regard religious faith as superficial or illusory.

Other modern Arab thinkers, such as the Egyptian A. R. Badawi and the Lebanese René Habachi, are renowned for their studies on existentialism in the contemporary Arab world. In *Existential Time* (1941), and *Studies in Existential Philosophy* (1961), Badawi stresses that human beings must accept the brevity of life and must face their fate with the power of true freedom. Although Habachi rejected existentialist atheism and illusory individualistic philosophy, he nevertheless urged people to transcend their individual limitations and seek a reality on a higher level, which constitutes the existential experience of humankind. Egyptian philosopher Zaki Najib Mahmud, whose principal works include *Positivist Logic* (1957) and *Toward a Scientific Philosophy* (1958), devoted himself to expounding Western positivism.

Philosopher Yusuf Karam was a pioneer of modern systematic philosophy in the Arab world. In *Reason and Being* (1956) and *Physics and Metaphysics* (1959), published not long before his death in 1959, he maintained that both empiricism and rationalism are untenable and that only by consciously drawing on pagan ideas can Muslim and Christian philosophers developed a comprehensive world view. His philosophical methods were representative of the trend in contemporary Arab thought to attempt to reconcile various conflicting philosophical and theological thought.

## African philosophy

Since the beginning of the twentieth century, the African intelligentsia have been examining their own continent's philosophical traditions and debating such issues as 'Does an African philosophy exist? And if so, how can it be defined?' In their discussions, they have obtained an affirmative answer to the first question, but the debate on the second one is ongoing. Many African philosophers believe that a sufficiently sound literary philosophical tradition has existed in Africa since ancient times. This view has mainly been expounded by Lancinay Keita, who has divided African philosophical tradition into three stages: (1) classical philosophy, mainly ancient Egyptian philosophical thought, which had a strong impact on the Hellenic world before it influenced the Renaissance period in Europe; (2) medieval philosophy, mainly comprising African interpretations of Islamic thought and particularly active under the medieval African states of Ghana, Mali and Songhay; and (3) modern philosophy, which encompasses (a) the relatively undeveloped philosophy prevalant in Africa during the colonial period, which had significant political and literary components owing to Africa's colonial past and (b) post-colonial philosophy.

Keita described the main characteristics of African philosophy as follows: African thought is essentially holistic in the sense that it accepts the material world, thus making possible empirical science, yet at the same time it recognizes that metaphysical elements constitute the ontological support and motivational force for movement in the world. Another important specialist on African philosophy is H. Odera Oruka, who divided contemporary African philosophy into six schools of thought: (1) ethno-philosophy, which regards all ethnic African world views, myths, folklores and folk wisdom as African philosophy; (2) sagacity philosophy, which deals with the wisdom of certain respected African sages, whose thought and wisdom derived from their innate insight and reason rather than communal consensus (the main representative of this philosophy is Marcel Griaule); (3) nationalist-ideological philosophy, which holds that genuine and meaningful freedom is inevitably accompanied by a true ideological liberation and a return to traditional African humanism; this philosophy has been mainly advocated by Kwame Nkrumah, Julius Nyerere (Plate 109), and Leopold S. Senghor, whose philosophy of 'Négritude' was popular in the 1960s (according to this movement, reason is Hellenic while emotion is characteristic of the black people, and African thought, being intuitive, cannot be viewed in terms of the rational, the irrational or the pre-rational); (4) professional philosophy, which rejects the assumptions of ethno-philosophy and takes a universalistic view, arguing that true African philosophy is the domain of African professional philosophers; this tradition is critical and strict and does not consist simply of interpretations and descriptions of African traditions of thought (its main advocates are Kwasi Wiredu, Paulin Hountondji, Henry Oruka and Peter Odera Bodunrin); (5) hermeneutic philosophy, which conducts analyses of specific concepts by using existing African languages in an effort to clarify the general and logical meanings of these concepts (it is mainly represented by Kwami Gyekye, Barry Hallen and Olubi Sodipo); (6) artistic or literary philosophy as adopted by certain African writers such as Chinua Achebe, Wole Soyinka, and Ngugiwa Thiongo, among others. Although not a philosophy per se, it has been shaped by the profound philosophical thoughts expressed in the works of these literary figures.

## Latin American philosophy

Mainstream schools of philosophy in Latin America in the twentieth century have come into existence by way of opposition to the positivism of Auguste Comte and Herbert Spencer. Generally speaking, Comte influenced thinkers in Brazil, Mexico, and Chile, while Spencer's following developed mainly in Argentina, Uruguay and Cuba. Positivism claimed that its knowledge had been verified, was logically strict, and could be easily applied to actions and help solve existing social problems. The promises it held out were fairly attractive to the Latin American intelligentsia. Indeed, many people hoped to find solutions to the continent's serious social ills, particularly poverty, through this philosophy. However, reality did not measure up to positivism's promises and aspirations. When progress failed to materialize, Latin American intellectuals turned against positivism, beginning in Mexico. With the fall of

the dictatorship of Porfirio Diaz in 1911, positivism also fell. And its influence subsequently waned in other Latin American countries.

Then, Latin American philosophy turned to the works of Bergson, Croce, Nietzsche, and Schopenhauer, who had criticized the narrow scientific emphasis of positivism. Since then, the continent has seen four generations of philosophers. The first generation is that of the trail blazers: Antonio Caso and José Vasconcelos (Plate 110) in Mexico, Alejandro Korn in Argentina, Vaz Ferreira in Uruguay and Farias Brito in Brazil, which had remained under the influence of positivism for some time. These philosophers developed a new philosophical thought in Latin America by borrowing heavily from European philosophers including Husserl, Dilthey, Heidegger and Jaspers. Although they did not form an actual school of thought, they brought forth a new philosophical attitude and method. The second generation was mainly represented by Francisco Romero, who carried on the traditions of the older generation, but was freed from the controversy over positivism that had influenced the previous generation. Romero and his generation were preoccupied with the problems of man and greatly influenced by historicism, phenomenology, and existentialism. Most of the philosophers of the third generation, represented by García Maynez and Llambias de Acevedo, were born around 1910 and studied philosophy in German universities. As a result, they were more professional and their interest more wide-ranging, even though none of them had the intention of creating a new philosophical system. The fourth generation is larger in number and more active. Augusto Salazar Bony and Auturo Roig are the most prominent members of this generation and remain very active in the Latin American philosophical circles at present. They have maintained their interest in German philosophy and attach great importance to British and American philosophies, particularly new headway made in analytic philosophy. Inspired by the enthusiasm of Mario Bunge, the current generation has conducted studies on the philosophy of science in collaboration with many professional scientists. Marxist philosophy has also been studied and spread on the continent. At present, Latin American philosophy is taking root in the cultures of various nations and is expected to produce more fruitful results.

## CRITICAL ISSUES IN CONTEMPORARY PHILOSOPHIES

In the process of diversification, contemporary philosophies have raised issues of universal significance regarding world peace, development and the future of philosophy and human civilization.

### Objectives and mission of philosophy

Most of the principal contemporary philosophical schools have criticized traditional philosophy for studying basic problems. However, they differ greatly over the interpretation of philosophy's meaning, subject matter and research methods. In the transformation of science and social life, contemporary philosophies study and explain man and reality from different perspectives. Philosophies based on materialism or scientific realism, which endeavour to integrate knowledge systems and to depict a general picture of the world, have reached an unprecedented breadth and depth in their exploration of the order of the macro-universe, microworld properties and the relationships between body and mind. Humanistic philosophies explain the world created by humankind and its culture in exploring self-consciousness and historical existence. Post-analytic philosophy has begun to take a new approach towards the study of the once-rejected metaphysics, which explains the relationship between language and reality in terms of integral experience or conceptual frameworks. Proponents of this school are therefore seeking new ways of 'philosophizing', and the 'way of philosophizing' itself has become a subject of great interest. Analytic philosophy along with other philosophies developed by Europeans stress the prominent role of language.

The linguistic ontology of current analytic philosophy undertakes in-depth studies on topics such as being, reality, truth, nature and structure of mind, while European continental philosophy regards language as the basic means of critically examining the meaning and value of modern society, culture and life.

Various contemporary philosophies have greatly contrasting objectives. Analytic philosophy views philosophy as an activity for diagnosing and treating linguistic and conceptual ambiguities and seeks accuracy of knowledge and scientific rationality. Some humanistic philosophies aim at describing the transcendental structure of consciousness, explaining the truth and value of life, fostering a mechanism for the healthy development of man and culture and overcoming the crisis of alienation in modern society. Stressing a scientific worldview, Marxism not only explains the world but also transforms its guiding practice so as to enable human beings to attain freedom from the realm of necessity, thus realizing the social ideal of humankind's overall development. However, despite their different theoretic orientations, contemporary philosophies have been pondering their common mission. Confronted with challenges to civilization and progress posed by the nuclear threat and ecological crisis, injustice and inequality, disparity between rich and poor, ethnic and regional conflicts, cultural contradictions and moral confusion, philosophy should provide new meanings and wisdom to the diversified development of culture and society and the establishment of a reasonable world order based on mutual cooperation. Philosophy must also attempt to examine and solve major problems emerging in scientific, cultural and social processes and to suggest viable guidelines for values and criteria regarding means to attain the good. Philosophy today, 'as the owl of Minerva spreading her wings with the coming of the dusk' of the twentieth century, should not only review its past journey, but also use its historical insight to examine the various contradictions to be faced at the beginning of the new millennium of civilization and to conceive an ideal that accurately reflects human nature.

### Scientific reason and humanistic consciousness

Theories of knowledge and methodology occupy a special place in contemporary philosophy. Philosophy cannot only contribute to the enhancement of rapidly evolving contemporary knowledge, but can also enable knowledge to

play an effective role in cultural and social development. Philosophical studies on knowledge and method in the past century have demonstrated the divergence of scientism and humanism. Scientism places great value on analytic reason and applies the methods of natural sciences as paradigms when studying all branches of knowledge. It attaches importance to studies on the truth of facts or events by using precise linguistic and logical analysis, stresses the usefulness and essential role of knowledge in social development and believes that rationalization of the social order and industrial civilization can be achieved mainly by involving human intellect. Humanism, on the other hand, maintains that all knowledge results from humankind's cultural creation and cultural foundations and that development should be explored by describing and interpreting the constructive acts of man's inner consciousness, and that all cultures, including scientific knowledge, are rooted in human existence and the concrete world. Therefore, humanism stresses the social functions of cultural values and criticizes the varieties of social ills resulting from undue emphasis on reason in technological civilization.

Scientific reason and humanistic consciousness are also embodied in the theories and methodologies of the natural sciences and socio-humanities, respectively. The former stresses intellectual, logical analysis and proof, while the latter focuses on the understanding and interpretation of socio-cultural phenomena. Scientism and humanism have both significantly enhanced our knowledge by using their specific methods, but they are also exploring some more far-reaching subjects that involve interlinking scientific reason and humanistic consciousness. The development of contemporary knowledge is characterized by a high degree of specialization and blending of disciplines and the interpenetration of knowledge from the natural and social sciences. This also requires the integration of scientific reason and humanistic consciousness, thus enabling various branches of knowledge to interpenetrate and complement one another. For example, contemporary philosophies have been paying more attention to bringing the development and application of science and technology into the orbit of rational cultural values in an effort to avoid the misuse of these and to ensure sustainable development and security for humankind. The rapid development of ecological ethics and bio-ethics in the past 30 years illustrates this point.

## Philosophical understanding of human beings

Human beings are another important subject of study for contemporary philosophers. However, great differences in the understanding of human nature and the meaning of human existence must be noted. Marxism holds that human essence is the summation of social relations and calls for the emancipation of mankind's essential power by eliminating *alienated labour*, namely enslavement resulting from irrational social relations. Analytic philosophy usually considers human nature through studies on the experience of linguistic behaviour and the mind. Others explain human nature in terms of irrational emotion, volition, or instinctive passion. Some contemporary humanists highlight the central position of man as subject, probe into the self-consciousness of transcendental or practical subjects, and endow human nature with attributes different from those advanced by traditional humanism. Moreover, they

criticize the fact that the Enlightenment considered abstract reason as the eternal human quality. Heidegger vehemently attacked the notion of an abstract human nature and stressed the temporal, historical and mortal nature of human existence. The structuralist attitude of anti-humanism actually denies the central position of subject in cultural shortcomings, even though it derived from European humanism. The historical image of the human being has diverse facets and has changed constantly. Therefore, it is inevitable that differences in philosophers' conceptions of human beings will persist. However, humankind must free itself of various kinds of bondages and suffering and achieve healthy development in order to fulfil its potential and build a place in the real world.

Truth and value are one of the same whole. In exploring truth, we also seek value, which constitutes a crucial issue in understanding human beings and their activities. Because of differences in national conditions, traditions and social systems, various societies have divergent value systems, and it is impossible to make all of them obey a single foreign value system. Contemporary philosophers have increased their exploration of axiology. Starting from their own philosophical principles and socio-cultural backgrounds, they naturally hold different positions on basic values such as the good, justice, equality, liberty and responsibility, right and obligation, fairness and efficiency, and on the criteria for choosing values. In view of the changes and contradictions in social life and in order to reform or improve the social system and moral life, contemporary philosophers attach importance to reflecting on ways of adjusting existing value systems. In his influential book entitled *A Theory of Justice* (1971), American philosopher John Bordley Rawls criticized the utilitarian value system prevailing in some industrialized countries and the ills it has generated. He maintains that a just society with a sound moral value system should be established according to the principle of equitable justice chosen by rational man, where individual freedom would exist alongside social cooperation and a relatively equal distribution of wealth and rights.

In their studies on human beings, contemporary philosophies have highlighted two other subjects of practical significance:

- *Human beings and social development.* The once-prevalent theory according to which development is merely a function of the linear growth of economic quantity and material consumption has met with criticism because it has led to social inequalities. The new visions of development perceive the human being as the goal of development and stress the need to achieve the overall physical and mental development of human beings within comprehensive social progress. This entails recognizing the crucial role of cultural value. Committed to this goal, UNESCO has since the 1970s contributed greatly to promoting studies on the role of culture in social development.
- *Man and the environment.* The ecological crisis that emerged in the industrialized world has prompted contemporary philosophers to once again reflect upon the relationship between humankind and nature. Rejecting the idea that the rational power of human beings is reflected in the conquest of nature, today's thinkers point out that if human beings, driven purely by practical considerations, excessively exploit Earth's natural resources, they will seriously jeopardize their

own existence and development. From the 1920s to 1940s, V. I. Vernadsky in Russia and Pierre Teilhard de Chardin in France formulated the theory of *noosphere*, which emphasizes that human reason, environment and universe constitute an organic and living unity and that society and nature, humankind and the biosphere should evolve in a coordinated and interconnected manner. This doctrine has fostered studies on the philosophy of environmental protection. Although they differ in theoretic orientation, contemporary philosophies generally claim that harmony between human beings and the natural environment should be guided by values compatible with the interests of the whole of humankind and that people should shoulder moral responsibilities with regard to the environment and ecology in order to ensure the survival of humankind and social development for future generations (Plate 111).

### Philosophical and cultural traditions and their communication

Philosophy as the theoretic core of cultural traditions is not divorced from history. The founding of a number of schools of philosophy in the twentieth century reflected a critical attitude towards traditions. Certain contemporary philosophies tend to reflect on traditions in a constructive manner, since they recognize their vitality and support the renewal of traditions in an evolving process. According to the theory of virtue elaborated by American philosopher Alasdair MacIntyre, in order to overcome the crises of moral relativism and scepticism in modern society, it is necessary to construct traditions to carry forward the essence of the Aristotelian tradition and to probe into the issue of 'rationality of modern practice' in an effort to reconstruct individual and social virtues. Philosophical circles in various countries, particularly developing ones, tend to emphasize studies on indigenous philosophical and cultural traditions. Increasingly, philosophers are of the opinion that traditions do not necessarily constitute roadblocks to historical progress and that those vital contents can take on new meanings and play a positive role in social development today. For instance, contrary to the individualistic value system dominating some Western industrialized countries, the collectivist value systems and other rational contents implied in the philosophical and cultural traditions of some East Asian countries are related to these countries' successful socio-economic development. This subject has attracted widespread attention in scholarly circles.

In the world today, global communication is increasing daily, and exchanges between various philosophical and cultural traditions have reached an unprecedented magnitude. Contemporary philosophers are concerned with understanding and dealing with such exchanges so as to benefit indigenous socio-cultural development and world peace and culture. Related studies have contributed to creating a growing consensus on a number of principles:

– *Respecting the diversity of national philosophical and cultural traditions*: Because of differences in historical conditions, nations naturally possess distinct traditions. Each nation should therefore understand and respect other traditions and acknowledge their important role in maintaining the identity of national culture.

– *Realizing complementarity between various philosophical and cultural traditions*: Indigenous traditions might be enriched by absorbing the outstanding achievements of foreign philosophies and cultures in the light of their local contexts. However, such assimilation must not be mechanical and rigid, because it could result in social upheaval, stagnancy or the disintegration of indigenous cultures. Contemporary philosophers value comparative studies on various philosophical traditions, which enable them to learn from each other's strong points and offset their respective weaknesses.

– *Promoting dialogue between different philosophical and cultural traditions to seek common points while preserving and respecting differences in an effort to safeguard world peace and development*: The world today faces the challenge of multiculturalism, and if not dealt with properly, collisions between different cultures, which could become a pretext for local ethnic or regional conflicts. The claim that in today's post-Cold War world clashes between different civilizations are inevitable and will dominate the global politics is simply untenable. As long as the cultures of the world communicate in a spirit of equality and mutual understanding and well-being, they can undoubtedly make new contributions to world peace and human civilization.

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# 22

## RELIGIOUS TRADITIONS

*Jean Lambert*

### THE COMPARATIVE STUDY OF RELIGIONS

Some twentieth-century thinkers have suggested that religions function like languages, and there is no other way of speaking than naturally. Faced with this irreducible plurality of 'religious languages', our only recourse is translation, since there is no single language that predominates. There are only 'regional accents' and 'new dialects' that appear or disappear, and in which the word *god* does not necessarily figure. 'Hinduism', for example, is an English invention of 1830; 'Confucianism' is a concept that does not exist in Chinese; in the Arabic language, the word *jihad* conveys the idea of endeavour or striving; and Buddhism is unaware of the self. These different variations on a theme gave rise to the twentieth-century idea for the study of comparative religion.

The comparative method is the only experimental approach that is able to shed light on the historical and anthropological study of religion. The history of religions is not a field of knowledge in itself.[1] Religious history, which was originally confessional in approach or took the form of apologetics, has given way to a more neutral kind of history. This secularization of the study of religions derives from the crisis of dissent within the institutions themselves, leading historians to seek the roots of these divergences and wonder at their meaning.

There are several currents of thought. *The sociology of religions* observes the actual dynamic of the break-up and re-forming of religious phenomena in the modern world.[2] *Ethnology*, working alongside a history of religions uncoupled from the evolutionist hypothesis, determines the specific function of religions within a particular social context. The semiotics of mythological narratives, rituals and pantheons covering broad linguistic areas helps to identify the fundamental ideological configurations that each society reinterprets for itself. Religious history correlates deviant forms and marginal religious attitudes with the social structures of particular periods. It is only over an extended period of time that it becomes possible to create links between the long-forgotten rituals that ethno-history brings to light, and the seemingly random proliferations that

today's sociologists have described. Modernity is in no way a 'revival' of religion, but by enabling us to gain a better retrospective grasp of what the past concealed, it sheds light on the vigorous nature of the religious element that social groups seems to require.

This rich deployment of the social sciences to illuminate religious phenomena owes much to the development of comparative anthropology, especially the anthropology of myths, which are useful for demonstrating how religions are organized according to a coherent architectural structure, and how the changes affecting them obey specific transformational rules. The French scholar Georges Dumézil took the decisive step in the comparatist direction by linking the comparative philology of Antoine Meillet and Emile Benveniste with the historic sociology of Marcel Mauss and Marcel Granet. Meticulous collaboration between the two disciplines made it possible to bring together the different religious systems of the Indo-European peoples in one and the same area of study, in which the ideological fields, despite their significant divergences, show structural analogies based on functional relations. The comparative method as a general approach to studying religion was officially recognized in 1935 at the Ecole Pratique des Hautes Etudes in Paris. The tripartite functional model has intellectual significance. Concordance between one religious system and another is not only linguistic or theological, nor does it concern only rituals and myths; it also determines the order of discourse. The comparatist seeks out the thought structures of this ideology by following the transformations and transpositions of a single model through all its historical variations. Dumézil turns a religious corpus into an objective, transcultural universe that must be studied in itself, without being reduced to an order of realities external to it, such as affective urges, ritual practices, historical facts, social structures or experience of the absolute. The religious phenomenon in its structural invariance, reconsidered from a broad comparatist angle, can be a powerful instrument for interpreting the unforeseeable variations of societies, on the basis of that which unites them.

By complementing structural analysis with study of the social and historical context in which myths emerge, we can arrive at a more precise knowledge of the diachronic

processes affecting traditional societies, while a broad post-structural analysis of the traditional religions of historical societies can give us a more systematic grasp of the coherence of their religions. It is by combining these two approaches that we achieve a broadly comparative science of religions capable of treating all religions on an equal basis while respecting their differences. If, someday, the world religions seem likely to make peace among themselves, it will be partly due to this intellectual effort: respect for others is not a conciliatory gesture reluctantly conceded, but must be sought after and recognized as a fundamental principle.

## MAIN TRENDS IN RELIGION

### Islamic fundamentalism

Fundamentalism is not specific to Islam. It is also present in Catholicism, Protestantism, Judaism and Buddhism. The 1970s and 1980s saw a general rise in the power of Islamism in the Muslim countries, as witnessed by the Pakistan National Alliance's religious agenda in Pakistan in 1977, the Islamic revolution in Iran in 1979 (Plate 112), the assassination of President Anwar El-Sadat in Egypt in 1981, and the fragmentation of Lebanon under pressure from the Hezbollah and the Islamic Jihad. Everywhere, from Sudan to Indonesia, Islam seemed to be diverted towards political ends, right up to the frustrated victory of the Front Islamique du Salut in Algeria in 1990, and the armed struggle in Egypt against the Mubarak regime. The challenges of modernity to Islam – the advancement of education and science, the development of independent reasoning, the desire for independence and political participation – were aggravated by the fact that most Muslim countries had been colonized by a Western, self-styled 'humanist' culture that many considered an affront to their dignity; often it coincided with people's nostalgia for earlier days of glory and power. At the same time, and despite their regained independence, these states that are muzzled by strong regimes and subjugated by world markets have not lived up to the peoples' expectations. People no longer tolerate the idea – current from the 1950s to 1970 – of the superiority of the Western model of development, especially since their political authorities have sometimes demonstrated their ineptitude for democracy.

The rise of different forms of Islamism is based on certain internal reform movements that emerged in modern times. The Muslim Brotherhood, which was founded in Egypt in 1929, seeks a complete return to the basic principles of Islam. Led by a supreme guide and systematically positioned in urban neighbourhoods, the Brotherhood devotes itself to the literal interpretation of the Koran, advocates the application of *shari'a* law, which alone is regarded as capable of solving problems of both individuals and society, and rejects any foreign 'contamination' of Islam. Spreading rapidly beyond the boundaries of Egypt, in forms ranging from pietism to extreme radicalism and terrorism, it has moved away from its reformist base and urged the humiliated *umma*, the community of believers, to put their trust only in Islamic law.

The Tabligh movement, founded in India and subsequently known under the name of Faith and Works, trains teams of missionaries who reject violence and work among the immigrant populations. During the social and

national protest against the brutal, secular modernization of the country, Iranian Shi'ism found a crucible from which emerged the clerical power that was to revolutionize the Shi'ite tradition itself. The Ayatollah Khomeini, exercising both religious and secular powers, revitalized a Muslim community both inside Iran and abroad; he drew upon the great Islamic principles to combat a demonized West, using military and other means. Saudi Arabia, officially custodian of Islam's holy places, has long financed Muslim communities in Arab countries, and immigrant Muslim populations through the World Islamic League, but its leadership was jeopardized by the rise of Iran and its 'betrayal' during the Gulf War of 1990. Saudi Arabia's subsequent eclipse has hastened the radicalization of Islam and the destabilization of the more moderate regimes, while Sudan, ravaged by civil war and famine, has invoked Islamic law against animist and Christian minorities. The revival of Islamism therefore took place in three phases. The rise of Iranian Shi'ism at the end of the 1970s, a populist uprising against an enemy demonized by an intransigent Islam, marked the rise to power of a political form of Islam that sought to use that power to establish an Islamic society. Pakistan, Afghanistan, Egypt, Syria and far-away Indonesia also adopted Islam as an instrument of resistance and opposition movements, while the established leaders in Libya, Sudan, Saudi Arabia and Morocco sought to use the name of Islam to legitimize their power and policies.

The success of this form of Islamism depends, however, on an unlikely alliance between intellectuals, young militants, the clergy and the common people. But it did achieve results throughout the Muslim world, including among immigrant populations, by building up a network of associations, by organizing religious activities centred on the mosques and by community development. Infiltrating civil society in order to occupy positions of influence and introducing a moral dimension into educational and social activities, this second phase found expression in the Algerian Front Islamique du Salut, including the latter's participation in the electoral process until it was halted by the authorities in 1992, thus leading to radicalization and bloodshed. Based on Islamic awareness-raising at the grass roots, this second form is as undemocratic as the first. Its relative lack of success has led to the established regimes being challenged by armed violence, whether ongoing as in Algeria or sporadic as in Egypt, or in Palestine with the Hamas, in an alternating process of provocation and clampdown in which Islamism, now armed, is a cause of concern to neighbouring countries.

Islam thus finds itself reduced through its own internal tensions to an ideology of social liberation and political conquest, underpinned by strict religious observance, and an Islamic organization of society, fragmented by revolutionary guerrilla movements, which divide it internally in direct opposition to its deepest objectives, that is unable to offer anything but a puritanical neo-conservatism, as restrictive as it is disappointing.

### The Vatican's efforts to prevent the decline of Catholicism

The Catholicism of the Pope serves as a worldwide paradigm of religion's crisis at the end of the twentieth century. The previous century witnessed the loss of the Pope's temporal

power, and the twentieth century may confirm the loss of his spiritual power,[3] for the Pope's strategy has been to counteract the dismantling of the institutional structure of belief. John Paul II's pontificate went through two phases. Until 1989, he was the Pope of human rights, the standard-bearer of emergence from communism and the establishment of political democracy. It was thanks to him that, in Poland, the three components of the *Solidarnosc* resistance movement – workers, intellectuals and the Church – came together, a pattern repeated throughout Eastern Europe. There is considerable ambiguity about the content of these 'human rights', but religious freedom, which was unacceptable to the communist authorities, created a semblance of consensus.

However, John Paul II was increasingly disconcerted. The societies that were supposed to undergo evangelical renewal soon displayed the same shortcomings as their Western counterparts. For John Paul II, the victory of the Church over atheistic communism represented the victory of religion over the modernity that had spawned communism. The new evangelism he expressed in *Crossing the Threshold of Hope* (1994) claims that, for three centuries, life and thought in the West was largely dominated by the combat waged against God, and that Marxist collectivism is only an 'aggravated version' of that programme to eradicate Christianity. The encyclicals *Centesimus annus* (May Day 1991) and *Veritatis splendour* (1993) deplore this perverse project of building a world without God, one which relativism aids and abets by obscuring the sense of a strong moral anchor. The encyclical *Evangelium vitae* (1995) is a sombre denunciation of 'the culture of death', with apocalyptic overtones.

After 1989, public debate in Poland turned to such questions as abortion, divorce and religious instruction in schools, with the Concordat between the Roman Catholic Church and the secular government enabling society to construct its own democratic pluralism. It was no longer thanks to the Church, but rather despite its opposition, that Poland moved towards democracy. The Pope did not denounce democracy, but continued to inveigh against a modern world released from the Church's grip. Freed from a system whereby meaning is collectively organized and imposed on the individual, post-communist society, and perhaps other societies still more, became receptive to the ideas of pluralism and relativism brought to the fore by globalization. The spiritual power of the Church saw this as a negation of the universal. Its project for a *universal* catechism that would offer a comprehensive account of Roman Catholic teaching came up against the expansion of the world, against individualization, rationalization and differentiation, as it did in the sixteenth century. Catholicism thus refused to accept that it was merely one option among a whole range of beliefs that may coexist in a democracy.

In the course of his many travels throughout the world, John Paul II countered this trend by reaffirming universalism, the maintenance of standards and continuity, unable to grasp that all the tragedies of the twentieth century had been tied to regimes professing a monopoly on truth. This blind spot accounts for ensuing profound disagreement over the link between ethical relativism, values and democracy. Democracy, however, is firmly situated outside the realm of values. It does not claim to arbitrate between good and evil, but endeavours only to provide a space within which such arbitration may take place and to define its

rules. Democracy is not the same thing as relativism and does not regard all opinions as being of equal worth. It makes the expression of all opinions possible and legitimate, and refrains from prohibiting any of them, provided they are expressed within the forum it creates and of which it is the guarantor. Any system setting itself up as an arbiter of the truth from which its legitimacy derives is one that rejects democracy: taken to its logical conclusion, this path would mean subordinating civil law to moral law and replacing democratic legitimacy by that of a Christian state, in which the Church ensures that the state's actions are in conformity with the truth and in which the place of non-Christians becomes problematic.

In 1995 alone, the 75-year old Pope John Paul II visited all five continents, attending everything from the gigantic world youth festival that brought three million people to Manila, to meetings in Sri Lanka to try to settle misunderstandings over Buddhism, which the Church considered an atheistic and negative doctrine of salvation, and the difficult dialogue with dissident Catholics in China. After his journey, the Pope altered his approach, shifting from open proselytism to a focus on ethics, which he believed would offer a unifying force that could transcend cultural differences. He surprised the United Nations – then celebrating its fiftieth anniversary – by proposing a 'Bill of Rights of Nations,' or a 'Charter of Nations,' to clearly identify the rights and duties of all the nations of the world, in order to contain aggressive nationalisms and to promote the right to freedom of the peoples of the world.

## The emergence of ecumenism

The Christian ecumenical movement was born in 1948, merging two streams of thought. One represented the more theologically inclined Faith and Order movement, whose primary goal was to bring together representative people from different Christian confessions to work towards the visible unity of the Church.

The other, the more pastoral Life and Work movement, was an attempt by Protestant and Orthodox churches to reach consensus on the churches' universal practical role in society and to relieve human suffering. These two currents, bound together by their dependence on mutual understanding, were joined by a third, the International Missionary Council, which proposed itself as a middle way between the abstract and the practical. This three-way collaboration has so far managed to surmount its various crises. In 1961, at New Delhi, the International Missionary Council came together with the Orthodox Church and the Moscow Patriarchate to form the World Council of Churches (WCC). However, because of its involvement in the refugee question at the end of the war, the ecumenical movement was seen by some as too political, whereas Roman Catholicism, which took unity for granted, accorded priority to communion in faith rather than to charity, thereby opening a Secretariat for Promoting Christian Unity at Vatican Council II. There are thus two Christian ecumenical movements: the Geneva-based WCC (in competition with the fundamentalist, Amsterdam-based International Council of Christian Churches) and the Rome-based movement.

The Life and Work faction within the ecumenical movement, with its concern for refugees, its sense of guilt

for Christian anti-Semitism and its concern for the churches of Eastern Europe, was based on the *Universal Declaration of Human Rights*. The upheavals of May 1968 brought with them an increase in the influence of the Third World and young people, who demanded more attention to issues of freedom, revolution, imperialism and racism. Responding to their concerns the WCC became politicized and took a leftward swing. With the churches in Asia and Africa gaining autonomy, a political and ecclesiastical 'Third-Worldism' voiced the need to become more nationalist in character. Yet at the same time, criticism of the Soviet regime was tempered by considerations of *Realpolitik* and the desire to avoid harming the churches that were collaborating with the Communist parties.

In the 1970s three issues came to the fore: the anti-apartheid struggle which, together with support for Asia, absorbed a third of the WCC budget; support for liberation theology groups in Latin America; and the role of women – first as a political question of representation, then as a societal one of participation. The women's issue eventually eclipsed that of the Third World struggle and, together with the youth question, became the overriding concern.

After 1989 and the collapse of the Soviet Union, a veritable 'new left' in the WCC became interested in a number of utopian and pacifist social ideas that could cool national ardour, ecological ideas of respect for nature, and feminist ideas about achieving a better balance between the sexes. These concerns, which originated in Germany and the United States, aroused little interest in the South, where human rights was a burning issue.

The third movement attempted unsuccessfully to achieve a synthesis between political commitment and doctrinal unity on the missionary question. It no longer focused on destabilizing the churches, but sought to establish a dialogue with the other religions by focusing on divine action and showing respect towards newly gained national independence. In the late 1970s, some wondered whether Christology should be abandoned in favour of the pluralism seen in political democracy, but they met resistance over the perceived status of other religions, including resistance in the form of Karl Barth's view of the 'theology of religions' as a human quest. Islam was an additional problem because it seemed pre-modern, slower to develop than Christianity and even resistant to modernizing.

For twenty years, those who advocated dialogue were out of favour. They attempted to show there was a valid alternative to the missionary approach, but first had to settle what was essentially an intra-Christian conflict. Consequently they had problems both with Faith and Order, which warned against the danger of religious syncretism, and with the political left over the recognition of other religions: what, for example, was to be done about the caste question in the dialogue with Hindus, or women's equality in the dialogue with Islam? For the left, there could be no preconditions for human rights.

The question of human rights and Islam may serve as an example here. The universal principles of human rights are derived from secular humanism and are often in direct conflict with certain cultural traditions. While they may be of concern to a Muslim, they do not derive from divine revelation and God's law. The believer regards them more as duties, with which human beings must comply, rather than as rights to be established for them. They also clash with the definition of the rights of individuals by virtue of people's membership in a community, as in the *affaire du foulard* – the controversy set off in France in 1989, over a state school's refusal to allow Muslim girls to wear the traditional *chador* or *hijâb* headscarf to school.

The goal today is to create a common ground for dialogue; but while progress has been made in bilateral ecumenism, multilateral dialogue has run out of steam due to the proliferation of new religious movements. Some hundred international inter-faith organizations have emerged, bringing sectarian movements together in various 'fronts' and creating a flourishing industry, in some cases concerned only with the environment. The WCC has consequently proposed a new ecumenical discourse: ecumenism is not about churches, but represents a quest for human unity, like a service to be rendered to humankind. It therefore cannot continue as a para-federal organization of churches, but must become a network of energizing agents and revival movements.

The Christian churches have modelled their organization on the world of politics, if not actually on business and the multinationals, whereas it is civil society, with its prescriptive power with regard to the state that needs rebuilding. This involves putting politics in its proper place and re-creating civil associations, as attempted by a new humanitarian movement, which is highly interventionist in respect of the state's legislative authority; or by feminist activism – allied with the gay rights movement – denouncing violence and hostile messages. With Christianity in a stable situation, indeed with Pentecostalism gaining ground, Orthodox churches tripling their numbers, and with Islam also expanding, the WCC seeks to be a forum for testing the ideas of the future. It no longer talks in terms of mobilization, and its future would seem to lie more in serving as a fallback organization – for rich Protestants perhaps – one which has the advantage of being there in the absence of any alternative, playing much the same role as the United Nations does for the United States.

Since the Second Vatican Ecumenical Council (Vatican II, 1962–65), the Catholic Church has resolved to maintain an ongoing dialogue with the WCC. The ecumenical project has expanded to include a dialogue between Christians and atheists, and subsequently into intra-faith dialogues, as at the Organization of the Islamic Conference (1969) or the Buddhist Council (1984); almost all the world's religious leaders came together to pray for peace at Assisi in 1986.

For Protestants and the Orthodox, as for Catholics, the current movement towards unity means total reintegration in a world undergoing total transformation. Such social changes were previously supposed to produce only sects, which reflect the effort on the part of an entire community to achieve reintegration. Ecumenism might now be understood as total reintegration, even in its non-Christian, inter-faith forms, which are trying to steer clear of the difficult course set by the policy of maintaining a common front against atheism.

A non-religious *ecumenology* provides for typologies of more universal value than those offered by theology, and it can open up other possible routes for examining the dialogue with atheism in a non-denominational perspective. A general ecumenology would make it possible to rethink some of the essential areas of religious studies. It would examine the overall problem of inter- and intra-faith relations in space and time – that is, the relations of all

religious bodies with one another, whether or not they belong to larger groupings, and how the different tendencies within each religious body relate to one another and to those within other denominations. Those denominations which refuse such an ecumenology have their own conception of what constitutes a desirable ecumenicity, sometimes in the ideological form of the 'cloud of witnesses' – mythic links in a chain between believers from different times and different places.

Many sects, the Quakers for example, have set themselves the task of reconstituting lost unity, but their thinking is as much utopian as pragmatic. Whether religious, para-religious or anti-religious, as in the case of secular ecumenism, which regards religions as an obstacle to the unity of the human race, the most diverse schools of thought and many new religions are forms – secularized or otherwise – of an ecumenical project that has sometimes been in gestation for centuries. Both ideologies and institutions have their place in this, and not only official institutions, but also congresses, symposia and the countless groups in which internal and external dissidents gather, producing new official, semi-official or clandestine liturgies, and the types of authority which preside over religious divisions or encounters. Such ecumenism is also the source of new relations between religions and non-religion.

We now see how comparatism, which was originally historical and rather textual, ethnological and rather anthropological, opens up at the point where the observation of lineages of belief and structural transformations intersect, a wide field for an ecumenology aiming to modify our perception of religious phenomena. UNESCO's own concern that religious developments should be included in the present cultural history of humanity is itself an example of ecumenology.

## The emergence of neo-Confucianism

Since it merges imperceptibly with traditional Chinese culture, and has no fixed beliefs or social structures other than those that society generates for itself, it is even debatable whether Confucianism should be considered a religion. The last observance of the sacrifice to Heaven, the most important ritual of the Imperial Cult in China dating from about 1300 to 1111 BC dates back to 1945; since then Confucianism has become a private affair without legal authority. Most families nevertheless remain attached to ancestor worship, to the cult of the dead and even to the worship of a household god, and also to observance of the traditional festivals (Lunar New Year, the Lanterns and Dragon Boat Festivals, the Seventh Eve, and the Mid-Autumn Festival) that continue to provide a cosmological framework for social life. The neo-Confucianism of the 1950s, whose aim was to reconcile scientific and democratic modernity with the values of Chinese tradition, was a rebirth of the religion and became established in Hong Kong where it has flourished.

Neo-Confucianism has gained new credibility because so many Chinese-influenced countries (Japan, Taiwan, South Korea, Hong Kong and Singapore) have successfully achieved modernization without sweeping away their traditions. They prove the point that modernization does not necessarily entail Westernization (Plate 113). China has seen a positive re-evaluation of Confucianism since the

1980s, detached from the observance of liturgical obligations, which are left optional, but holding fast to reverence for spiritual and moral values. Confucianism lobs back into the Western court Max Weber's ill-informed opinion that without transcendence moral action lacks a powerful lever. The neo-Confucianists, who are admirers of Kant, believe that precisely because it is free from theology (and therefore provides proof against rational criticisms), their meta-ethics might offer a source of a spirituality that respects human rights and a particular form of democracy, against the background of a natural, conservative social hierarchy. As a religion of humanist culture and a philosophical doctrine of saintliness, neo-Confucianism may contain the seeds of a new China and South-East Asia, and, more broadly, hope for a new, non-Western humanism.

## The proliferation of sectarian movements

'Sectarian' movements are movements that owe allegiance to a leader or a doctrine. It might be argued that a major church is perhaps no more than a sect that has made the grade and continues to produce sectarian offshoots. Since the Second World War, for example, Protestantism in the English-speaking world has provided fertile ground for sects particularly inclined towards proselytizing; but what is new is the worldwide proliferation of sects (180,000 in Japan alone), the current success in the West of these groups since the failure of the protest movements of May 1968, their Oriental sources of inspiration and their transit via the United States. The first sects issuing from within Protestantism recruited adult females from relatively deprived social backgrounds. The new sects recruit young people from the educated middle classes, exhibit extreme anti-intellectualism, as in the case of Scientology or Transcendental Meditation, and lay great emphasis on affectivity. They generally profess a total rejection of politics, while developing, as in the case of the Children of God or the 'Moonies' (the followers of Sun Myung Moon and his Unification Church), a specific vision of history or salvation.

Such sects, or cults, have in common the practice of meditation under the authority of a leader to attain 'spiritual' power, since they place individual self-improvement, ideological conversion and transformation of behaviour above collective action in the world. They may sometimes aspire towards the union of religions and peoples, but this is not so much a matter of ecumenism as of proselytism, their communal lifestyles being intended to demonstrate solutions to human problems but with no direct connection to the outside world. The pyramidal organization of these sects, with the mass of the membership cut off from the leaders, and the followers' wills subordinated to a totalitarian organization, provides a regulatory framework not so much for a life of asceticism as for one of uninterrupted activity and work; this work is done for the exclusive benefit of the sect. Under cover of restoring authenticity, sects are often run as very well-structured businesses, exploiting the credulity of their members. In almost every case, they manipulate minds in a manner contrary to human rights, or may even themselves be connected with dangerous criminal enterprises.

For example, the Japanese Aum Shinrikyo sect carried out a gas attack in the Tokyo underground in 1965, killing ten people and poisoning 5,000. What becomes of an

apocalyptic religious message in an affluent society when fear, disease and poverty are not sufficiently distressing to provide the normal intake of recruits? The sect calls for the reconstruction of this world, but only after the world it denounces as evil has first been destroyed by criminal acts. This same argument was used by the Solar Temple Organization to lead a number of its Franco-Swiss disciples into collective 'suicide' in the Vercors area of France, and in Canada.

The International Society for Krishna Consciousness, founded in the United States in 1966 to propagate a lifestyle based on Vedic principles, has had to dismiss several of its leaders. It has a worldwide presence and its followers lead austere lives, reciting the great prayer (*mahānantra*) 1,728 times a day, and obeying a spiritual master in the belief that the Vedic model of society can lead to spiritual progress for all.

Nichiren Shoshu, a branch of Japanese Buddhism, has disavowed the Soka Gakkai sect, which also has its own political party. In its desire to counterbalance a communitarianism it regards as excessive, this movement, like the Agonshu movement, declares legitimate the expression of personal desires, and it asserts that individuals must find their own way, strengthen the personal element of their belief, and assume a certain degree of independent choice.

The Holy Spirit Association for the Unification of World Christianity was created by Sun Myung Moon in 1974. It was initially violently anti-communist, but after first scoring successes in Japan and the United States, has now allied itself with North Korea. This messianic group sees itself as the advance guard of a new humanity that will one day govern the earth. It regards marriage as the second birth of man and woman; and, as part of his aim of establishing the kingdom of God on earth and the future unity of nations and religions, Moon himself selects and proposes spouses for his followers, who live in communes.

The Divine Light Mission of Guru Mahara Ji, founded in India in 1960, offers its disciples spiritual knowledge through meditation. Trust in the perfect Master is essential, whether the disciples live in *ashrams* or in their own homes. Transcendental Meditation, introduced into the West from India in 1960, uses concentration on a ritual formula to achieve a simple state of consciousness. The practice, which is used as a relaxation technique in American institutions such as the army, universities and prisons and in some monasteries, is said to have been scientifically tested.

The Church of Scientology, founded by the American L. Ron Hubbard, also offers a means of transcending the ordinary state of self-consciousness. To this end, it employs an explanatory theory of the world and techniques of psychological contact, which the members learn on fee-paying training courses. Although often criticized by former members for using indoctrination methods at variance with human rights, it is extending its influence while attempting to gain legal recognition as a fully fledged church.

The various sects of Latin America have developed out of their own syncretic religions, drawing on Afro-Indian, Christian or spiritist components and the various Catholic and Protestant revivals. The traditional *candomblé* of Brazil, which has practically disappeared, used the cult of the Catholic saints as a cloak for the secret worship of the spirits of Yoruba origin known as *orixas*. Animal sacrifices conducted in the nagô language enabled spirits to be contacted directly through trance-states. The claim to African authenticity, here extended to cover the Caribbean, is expressed through the assertion of kinship links with African ethnic groups. *Umbanda*, which has an impact among the white urban middle classes, borrows the element of collective trance from *candomblé*, and that of possession by the spirits of nature from the native Indian cults. Other borrowings from spiritism include communication with the spirits of the dead, the idea of spiritual progress through reincarnation, the duty to do charitable works and a certain idea of a historical reason governing the evolution of spirits.

In 1992, the Assembly of the Council of Europe issued an important statement on measures to counter abusive activities on the part of sects. Rather than recommending new legislation – which would be very difficult to draw up at the international level while still respecting freedom of conscience – it suggested that all available resources of existing local law be used to that end.

## The renaissance of the Russian Orthodox Church

With 90 per cent of its members in the former communist countries, the Orthodox Church went through a long struggle for survival before experiencing a genuine renaissance after 1988. Its autocephalous churches, organized into five patriarchates, with that of Constantinople enjoying symbolic and historic pre-eminence, are theologically federated and manage themselves collectively through Councils. These churches, which are often defined on territorial lines, are in some cases national churches, as in Greece, or exist within specific national boundaries, as in the case of Russia, Belarus or Ukraine.

The Russian church, persecuted by atheist propaganda after the 1917 revolution, but granted the right to exist under Stalin, acted in a relatively docile manner. This was the price to be paid for its survival at the international level while it underwent persecution and prosecution at home, particularly after the new atheism offensive of 1959. Though it had its own sources of income, it could function only liturgically, and thus encountered a serious problem of transmission, being unable to provide religious education for its clergy and lay members.

The collapse of the regime in 1989 left the Russian church in a quite unprecedented situation. For the first time, it found itself free of state control and faced with a situation more akin to the French style of 'laicity' than its own historical tradition. It has had churches restored to it, has opened monasteries and theological schools, and has even been permitted to build new churches. Having had to assume responsibility for its patrimony, it is now impoverished and has even called for its old property and revenues to be restored in order to reduce the burden of debt. It has also begun to establish social and charitable organizations, but it is short of people, and its intellectual tradition needs updating, having been isolated from religious scholarship for eighty years. For this task, it does not yet have the means to introduce new ideas into its preaching, publications or youth activities, as does the Greek Church through its Zoë movement. It receives aid, often the subject of controversy, from missions of the Uniate Churches (Eastern Rite Catholic), which have places of worship they wish to recover, or from wealthy American Protestant missions.

Patriarch Alexis II, elected in 1990, is faced with ultra-nationalist, fundamentalist, anti-Semitic and anti-ecumenical tendencies within his church. Ecumenism does, indeed, clash with the strong missionary stance of Orthodoxy; the latter has, for example, used its base in Alaska to develop an American church, drawing on the strength of the Russian diaspora, and has also built up a sizeable church in Uganda. The American Orthodox Church, which has been virtually autocephalous since 1970, is the fourth-largest church group in the country and driving a theological and liturgical revival; however, American Orthodoxy has not accepted the Patriarch's expression of repentance for past 'failings'. The Russian church, which is nationalistic, conservative and significantly influenced by its diaspora, is very active in the WCC, particularly in the Faith and Order movement, where it provides a link with Catholicism, transcending divisions through its vigorous Trinitarian theology.

## WORLD RELIGIONS AND INDIGENOUS BELIEF

Could it be that we shall one day need to classify these fragmented, fundamentalist, charismatic, syncretic and sectarian religious currents as global forms of religion while classifying the great institutional religious traditions as indigenous, localized religions? A twofold development – fragmentation of the great faiths accompanied by a proliferation of new forms of religion – has indeed characterized the end of the twentieth century, with its widespread attitude of believing without belonging. The geographical contour lines of religions are also becoming less distinct, since the resonances of the various religions are felt far beyond their places of origin. Global religions are becoming indigenous, culturally specific religions, while indigenous religions are being exported worldwide. A contemporary account of religion can no longer accord priority to the great traditions, such is the extent now of their fragmentation into scattered groups without a common credo. This fragmentation contrasts with the feverish ecumenism of the major organized religions, which, paradoxically, it reinforces. The established institutions find mutual reassurance in their common defiance of divisions or sects, without always understanding that these represent an effort on the part of an entire community to recover wholeness and provide itself with an overarching perspective, so as to move beyond its contradictory relations with the world.[4]

The second half of the century saw all the world's religions in a standoff with democratic modernity which, even though it has made little headway, is becoming the unchallengeable requirement. Religions are all trying, however falteringly, to follow or anticipate the slow but steady establishment of a universal substrate of open, tolerant, fraternal, humanistic secularism – this being the shared precondition for a coexistence respectful of the authenticity of different cultures in the modern age. In this sense, and even though it is characterized more than other religious movements by a constitutional fragility and complexity, Protestantism – or rather that 'reformed specificity of belief' – is becoming like the common source of inspiration for the current developments, whereby a fuller inner life for each believer is accompanied by a heightened sense of civic responsibility. Religions, by shedding their institutional character, are

clearing a space for a civil, ethical and secular cosmopolitanism of a quasi-Confucian kind, in which identity-related emotions become purely personal concerns. It is in this context that reactive outpourings of all kinds can be understood.

## Back to 'true' religion: fundamentalism in its various forms

No definition quite fits all the forms of religious extremism that are now omnipresent on the world stage, but what they do share is a vigorous reaction against modernity, rejection of an imposed secular model, and affirmation of transcendence in a disenchanted world. They accord religious significance to political action, direct their message at the younger people who have been relocated to places not deserving of the name of towns, and are led by middle-class elites who freely resort to modern methods of communication.

All these movements dissociate themselves from three aspects of current society. Firstly, they display a common hostility to modernity, which they see as ungodly and inseparable from secularization or laicity; they challenge the Western model of civilization with its universalist pretensions, and wish to reconstruct unadulterated communal identities. Secondly, taking account of the failure of the secular ideologies of liberation and progress, they propose an alternative both to materialistic, neo-liberal development and to actual socialism, particularly of the state-nation-party kind, the failure of which in Eastern Europe and the Arab countries has created tensions over questions of identity and made it necessary to find rapid remedies for economic failure. Lastly, the era of political federations and blocs has come to an end, leaving behind a welter of nationalist and ethnic claims which had been kept for too long in deep freeze, while centuries-old conflicts are also resurfacing to stoke up these tensions. These various forms of resistance present a head-on challenge to tolerant relativism, respectful of otherness, proposing in its place a mythologized version of the origins of religious society; they are nevertheless perhaps laying the groundwork, despite all their excesses, for a non-Western way of modernization.

Within Judaism, Christianity, Islam, Hinduism or Shinto, we can see a definite upsurge of fundamentalist movements advocating the maintenance or restoration of the religious system in its totality. Shinto, generally regarded as the natural religion of Japanese tradition, is seeing new tendencies emerge as it adapts to an urban milieu its notions of purity, harmony between the gods, humans and nature, and protection with earthly benefits in view (Plate 114). The Jewish Lubavitch movement proclaims that the coming of the Messiah is imminent, and preaches strict observance of the 813 mitzvoth, or divine commandment, of the Torah. This movement, which is influential in the United States and France, criticizes what it regards as the excessively secular Zionism of the State of Israel, which it wishes to see turned into a purely Jewish state, without non-believers. The Jama'ah Tabligh, the society for the propagation of Islam created in India in 1927, to rid the Muslim minority of cultural contamination, has a widespread presence in all European countries with Muslim minorities. It calls for believers to emulate the prophet in all areas of life and organizes community support networks.

In the United States, revivalist religion is spread by the preaching of tele-evangelists and at giant meetings where

the audience are called upon to convert, bear testimony to healing or be baptised. Within the framework of a fundamentalist trend towards a literal reading of the Bible as the direct expression of divine truth, the revivalist movement campaigns in favour of a 'moral majority' in politics and against secular humanism and such ideas as Darwinism, abortion, divorce, and pornography. Influential in the United States, the revivalists are also enjoying notable success in Latin America, where they draw support from conservative circles. Another movement, the charismatic revival, was born in the United States in 1967, spreading shortly thereafter to Europe, particularly to France; it operates through communities characterized by a strong assertion of identity, an invitation to inward conversion and a group life of an emotionally involving kind, dissociation from the ambient secularization and a desire to rebuild a Christian sociality. In a similar vein, the Communion and Liberation movement, which originated in Italy and includes communities, associations and charities, and has a magazine translated into six languages, radically challenges secularized modernity, which is blamed for both totalitarianism and Western imperialism. It argues that only a return to the all-embracing truth contained in Holy Scripture can provide a basis for the complete reorganization of society. Whereas Jewish, Muslim and Hindu fundamentalists aspire to a society governed by religious law, Christian fundamentalists seem to accept a de facto separation of the temporal and the spiritual.

### 'Recourse' to religion: Liberation theologies

Gustavo Gutiérrez defines liberation theologies as 'discourses on faith in the Latin-American context', a context characterized by the political instability of the 1960s, dependence on American capital, social structures left over from colonial times, runaway population growth, and poverty in the countryside and the urban shanty towns. The Latin-American church was both highly conservative and a church of the common people. Beginning with grassroots communities established in the 1960s, a new ecclesial practice was inaugurated, involving mutual aid, literacy teaching, vocational training and political participation. With that practice came a new reading of the Bible. In 1968, the Latin American Episcopal Council of Medellín (Colombia) denounced 'institutional violence' and advocated 'the preferential option for the poor'. This interplay between the historical reality and the voices of the faith marked the birth of liberation theologies, which have no hesitation in using Marxist analysis to denounce injustice. The ruling and propertied classes clamped down violently on this church of the poor, thousands of whose activists, priests and nuns were killed, including Archbishop Romero of San Salvador, in 1980 (Plate 115). The liberation theologies were condemned in 1983 by the Congregation for the Doctrine of the Faith and came under attack from the highly conservative bishops subsequently appointed in Latin America. With the collapse of communism, liberation theology took a more environmental turn. Elsewhere, however, as in the case of Hinduism in the great Indian cities, there has also been a liberatory religious commitment to the cause of the most deprived.

By virtue of their role as reservoirs of meaning in a world in crisis, religions actually divide men and women more than they contribute to the cause of brotherhood, as most of them claim to do; but today's conflicts are more an expression of the crisis provoked within religion by the need to accept the rule of law and religious pluralism. The question is whether or not their present divisions will ultimately lead to their integration into the democratic model.

## FORMS OF BUDDHISM

At the beginning of the twentieth century, the Buddhist faith was losing its prestige and power in almost every part of the world: in Korea, in Viet Nam, in Japan, where it was losing ground to Shinto, and in China, where it was being supplanted by Confucian studies. The situation was better in some regions of South-East Asia, such as Cambodia, Laos and Siam (now Thailand). The celebration of the 2,500th anniversary of the death of Buddha in 1956 showed that the religion had been revitalized by its association with nationalist movements, as in Burma (now Myanmar) (Plate 116), and through Western scholars' research on the classical texts, which had come to them from the Japanese. In Ceylon (now Sri Lanka), many young converts to Christianity returned to the faith of their ancestors. In India, Buddhism ceased to be regarded as a heretical sect. There was a more vigorous revival in the countries of Mahāyāna tradition than in those of the Theravāda persuasion. Mongolian Buddhism (Plate 117) was almost wiped out, and the Democratic Republic of Korea also proclaimed that the religion had been successfully eradicated.

By the early 1970s, the history of Buddhism seemed at an end in Asia. In 1980, however, China attempted to make amends for its crimes in Tibet, although the problem of its relations with the Dalai Lama, now the uncontested leader of the Tibetan people, is far from being resolved. The Soviet regime's collapse opened up new prospects for Mongolian Buddhism, and monasteries were re-established in 1990. In China, institutes of Buddhist studies have been set up, and the popular practice of pilgrimage has revived, while an increasing number of works of scholarship, popularization and art are being issued. Generally speaking, the spread of Buddhist studies in other parts of the world, including the West, where Japanese Zen and Tibetan Tantrism are making converts, seemed to be playing a significant part in its revival at the end of the twentieth century. However, the movement towards syncretic forms of Buddhism, as in Japan (the Agonshu group or the Soka Gakkai sect), does show evidence of an adaptation to certain Western values such as individualism and universalism.

## FORMS OF HINDUISM

Poised between the chaos of sense impressions and the abstract markers of rational metaphysics, the symbolic universe of the Hindus turns religion into a means of regulating affective tensions. As a symbolic halfway house between the two, Hinduism has a self-protective function, compensating for the necessary social repression of desire with an ideal projection of real life. Human life is at its fullest in a theatre, and all the festivals and rituals of Hinduism play their part in the readjustment of levels of reward for one's acts (Plate 118). The Indian Republic is a

secular state, which is why partition – a betrayal of the hope for unity – continues to be a bone of contention. The republic has developed its own brand of secularism, in which the functions of Brahman and king are embodied in two distinct personages, but in which each community, sharing a certain number of often internalized norms and codes, tends towards automatic defensive or aggressive reactions.

This explains why non-violence is the ideal of this multicultural society; yet the violence held in check within this uneasy coexistence does at times break out, as in the paradigmatic case of the Ayodhya mosque, where there were clashes in 1949 and again in 1992. The mosque stands on the ruins of an earlier temple that once marked the birthplace of Lord Rama, a monarch and one of the most revered deities in the Hindu pantheon, whence its symbolic importance as a focus of political and religious conflict. On the whole, however, the revival of Hinduism has turned a doctrine of renunciation into a strong theory of social reform that has been at the root of India's twentieth-century renaissance. In a society stifled by custom, the doctrine that social upheavals form part of the divine plan when a society is in decay comes as a reassuring revelation. Tilak, Gandhi and Aurobindo were all, in their various ways, interpreters of the Gita in terms of action in daily life. The West also made a significant contribution to this reform, and some English-language commentaries were influential throughout India. Together with political unification, the existence of English as a national language was an essential element in the Hindu renaissance.

A decline in sectarianism ensued, and some genuinely saintly figures have emerged. Drawing upon the exemplary lives of these men and women, as well as the Bhagavad Gita – an episode of the *Mahābhārata*, an authoritative holy book interpreted in the light of modern social problems – Hinduism has been able to keep pace with the major changes in the world and even to rid popular Hinduism of its formerly conservative character. The end of the century did, however, bring something of a revival of sectarian movements, such as the Rashtriya Swayamsevak Sangh or the Shiv Sena, which are reacting to the withdrawal of the religious sanction from social institutions and are attempting to halt modern, constitutionally based political reforms. These extremist movements, reviving the old dream of the Hindu nation, the *Hindutva*, use religion for ideological and nationalist ends, thus posing a threat to the fragile model of the secular state.

## BLACK AFRICAN RELIGIONS

The black African religions, with their insistence on recounting the origins of everything except the Supreme Being, give the impression of having existed unchanged from time immemorial. Yet having encountered Islam and Christianity, they too have undertaken a complex process of survival which, through resistance to colonization, has served to maintain the cohesion of African societies. Whereas in 1965, half of the African population was animist, by 1985 one-third was Christian, one-third Muslim and one-third followers of traditional beliefs. However this relative decline is deceptive, for it conceals a renewed vigour, linked no doubt to an exceptional population growth. African beliefs overcame 'Black Islam' and put pressure on Christianity, setting off a theological reaction of enculturation. The ancestral practices relating to birth, circumcision, marriage, soothsayers, protection against the evil eye, witchcraft and death have continued under cover of the Five Pillars of Islam; but these practices have been confined within an individual life compatible with membership in the transnational confraternities (lay religious movements), and have been reinvigorated by native prophets – thereby according a seal of universality to black African authenticity.

Membership in African independent churches has tripled, using reinterpretation of the Bible as a kind of therapy, and prepared the ground for political reawakenings. The preaching of black messiahs or prophets enables the faithful and their clergy to resolve problems of caring for the sick, predicting the future and protecting against evil, adversity and witchcraft. The key component here is possession, for the trance state in collective therapies affords powers of second sight which make it possible to diagnose the causes of sickness or misfortune, and to prescribe remedies and patterns of behaviour, more or less in keeping with the Biblical message. Simon Kimbangu in Zaire[5] began with miracle-working and ended with thirty years in prison. He foretold an apocalypse that would set black people free, and an era of prosperity. The church structured by his disciples was opposed to fetishism and witchcraft, but it gave fresh impetus to ancestor worship and a certain moral order; its long and fervent services celebrated a faith in the future from which the leaders and popular supporters of the march towards independence would emerge. These independent churches act as intermediaries between the traditional religions and Christianity. They transform the framework of ancestral beliefs and their message of salvation, adapting that message to the upheavals following on from the achievement of political independence, to the wind of freedom that touches all social strata, and to economic difficulties, particularly those affecting the most deprived who, with their aid, are enabled to survive increasing adversity.

## FORMS OF JUDAISM

In 1900, most centres of Jewish teaching and most leaders of the Jewish spiritual communities were found in Eastern Europe. The Nazi programme of systematic extermination did away with almost all of them. By mid-century, the survivors had emigrated either to the United States, where they became full members of a predominantly Christian modern society, or to the new State of Israel, where the problem of the relationship between the state and the Jewish religion arose. The Western European Jewish communities were already partly secularized and integrated into modern society. This tendency was also seen in the United States in the Reform movement, which was opposed to Zionism; and even orthodox congregations became increasingly Americanized. Jewish community unity was further reinforced by the mutual aid services and networks established outside the synagogues. The attempt, around 1950, to give these mutual support networks a Jewish content came into conflict with the traditional stance that recognized the conscience as the sole authority in matters of moral responsibility. It also reinforced the wave of religious enthusiasm after the Second World War, an enthusiasm directed not so much at integration and assimilation as at a strengthening of community ties.

The confrontation between Judaism and modern industrial life also affects the State of Israel. The very diverse religious conceptions in that country run the gamut from strict orthodoxy to atheism. The influx of practising Jews from the Arab countries swelled the ranks of pious families, but the transition to secular Israeli life brought a clash between Eastern and Western cultures. The conflict between conservative orthodox tendencies and secular, left-wing attitudes left the majority of the population somewhere in between, neither religious nor atheist. The problem both in America and in Israel in mid-century was the extent to which the religious component was viewed as necessary for the survival of the Jewish people.

The question itself reveals how important were the problems of secularization. The conflict with Palestine was to reawaken the religious component in order to justify the policy of settlements. After the Six Day War of 1967, the annexation of East Jerusalem, Judea and Samaria that released repressed religious sentiments both in Israel and in the diaspora, led to the rise of ultra-orthodox elements (Plate 119). A messianic and activist religious Zionism (the Gush Emunim of 1974), defended the occupation of Palestinian territories by Jewish settlers in the face of international opinion. The secular aim of its founders that Israel should be a normal state runs up against the stress laid upon the unique character of the Shoah. Although the religious parties play a role as arbiters in Israeli politics for demographic and social reasons, there is no reason to conclude that Jewish fundamentalism is taking over from the time-honoured tolerance of Sephardic Judaism, which is still the majority tradition.

## FORMS OF ISLAM

Twentieth-century Islam, because it determines both the law-making process and the mode of life of its followers, has become an essential factor in the liberation movements of the Muslim peoples, and also in the social upheavals within Muslim societies. Despite what is, in some cases, a marked degree of secularization, the general trend has been towards intensification of religious allegiance (Plate 120). As both a political and a cultural source of nationalism, Islam conferred a religious character first on the struggle against Western domination and then on the combat against those domestic authorities that were regarded as lacking legitimacy. The dissolution of the Ottoman Empire and the abolition of the caliphate in 1924 contributed to the rise of Arab nationalism, and new nations, from Indonesia to Morocco, threw off colonial domination. While a number of Islamic states gained their independence, real religious power remained in the hands of the ayatollahs. The fact is, however, that Islam renews itself in the same way as it originally came into being, namely, when a religious message challenging the establishment rallies a mass following around a core of intellectuals. *Fitna* or dissidence, which is Islam's besetting fear, is also the source of its permanently revolutionary character.

Arabs make up only one-fifth of the world's Islamic population, which is now dominated by India, Pakistan, Malaysia and Indonesia. Any sense of a world Islamic community is at variance with the reality of the geographical states, and with such forms as that practiced by the 'Black Muslims' in Africa and the United States. In spite of some marginal work done by both Christians and Muslims, Koranic exegesis has remained isolated from comparative study. Reformers, both progressive and reactionary, have called for a return to basics whereby the *shari'a* or Islamic law will inevitably conflict with the modern world.

Whereas the tendency early in the twentieth century was to incorporate Western ideas into Islamic thought, by the end of the century it seemed as if the tendency was rather to impose Islamism and its reputed harmony of nature and science on Western thinking. In place of the modernist renaissance movement of the previous century, the end result has mostly produced a popular expression of a radical Islam that seeks to outflank orthodoxy by a practical form of loyalty, by active solidarity and determined struggle. Reformist and modernist ideas are perceived as leading only to irreligion, and activist movements such as the Muslim Brotherhood are prepared to go to any tragic lengths to free people from alien ideas and Western domination. The anti-intellectualism of the reformers is partly responsible for this, because it has not linked the political priority of social reforms and spiritual reawakening with theological advances.

The substantial increase in the number of pilgrims to Mecca as a result of mass transport has strengthened the hand of conservatives in all parts of the Islamic world. Faith alone seems more liberating than considerations of its content: doubt, discussion and questioning are treated as signs of defection from the daily battle. Consequently, it is still ignorance that provides the breeding ground for virulence and extremism; yet, paradoxically, it is the educated, even the university-educated circles who lend unexpected support to fundamentalism through their argument that achieving independence is a religious act.

The fundamentalists have forced all other groups within Islam onto the defensive by arguing that the only choice is between fundamentalism and secularization. In the nineteenth century, the *shari'a* was the official legal code only in Afghanistan, Saudi Arabia and Yemen; everywhere else Islamic principles were integrated into the modern state or, as in Turkey and India, were expressions of a minority voice being heard in a secularized society. In the twentieth century, however, the tide of secularization has turned: the family, religion and human relations are once again seen as the cement of communities, to the detriment of the notion of citizenship. In the former USSR and China, those Muslim religious minorities that had been forced to integrate into the communist state have put up resistance in the form of liberation struggles, particularly since the collapse of communism.

Islam at the end of the twentieth century was a divided Islam, torn between the demands of a simplified faith – one not yet translated into contemporary terms – and the pressures of the modern world. All over the world, whether among immigrant communities in the West, in the Arab countries or in the Indonesian archipelago, the question is how a revealed political and religious faith, albeit one of moderation, can express itself within the framework and the mindsets and imperatives of modernity and internationalism.

## FORMS OF CHRISTIANITY

Western forms of Christianity had sprung from rural societies, and were all affected by the changeover to a predominantly urban, industrial society. In Europe, for

example, there was initially a sense of religious decline, whereas a certain revival occurred in the United States. The churches attempted to adapt their language to what was for them an unfamiliar society, without really succeeding in doing so. The new classes of blue-collar and clerical workers slipped through their nets. However, Christianity fought back, and even found a Protestant-type congruence between the modern assertion of the individual and the Christian dignity of the human person. While Catholicism was chiefly represented by the activity of its leader, the various branches of Protestantism, which diversified yet further during this period, were mainly affected by trends towards religious renewal, ranging from extreme fundamentalism to loose groupings of vague beliefs; some other tendencies within Christianity retreated to aggressively traditionalist positions.

## Vatican II

The Second Vatican Council, proposed by Pope John XXIII in 1959, took place between 1962 and 1965 under his successor, Paul VI. There were three items on the agenda: the biblical movement, seeking to build upon the advances in critical exegesis; the liturgical movement, seeking to offer congregations an understanding of and greater participation in it; and an ecumenical movement, expressing a common resolve to contribute to the unity of the universal Church. Behind all this, however, lay a much broader and deeper drive to adapt the Church to changes in the modern world, a drive that had its origin before the war within the Catholic Action movements; one important feature was the assumption of responsibility by lay people. Vatican II cannot be reduced merely to the documents adopted there, since it generated much ferment. Some of the stands taken do, however, represent a profound change, such as the statement on religious freedom, the half-hearted recognition that non-Catholic churches were genuinely Christian, recognition of the responsibility of lay people and Christian responsibility in determining the values of the human community, and the reform of the liturgy, with the move from Latin to vernacular languages.

With hindsight, it is clear the speed of the transformations help explain the ambiguous character of its results. The fears engendered by the political, economic, technological and cultural crises of society seem to have proved the opponents of the Council within the Church right. The controversy surrounding Mgr Marcel Lefebvre, the French traditionalist prelate who in the 1970s challenged Paul VI by setting up a breakaway community, is a case in point; but this ambiguity is even more apparent in the paradoxical attitude of the papacy under John Paul II (Plate 121): while supporting human rights and justice the world over, it nonetheless used the Vatican's institutions to slow down development and has aggressively retrieved lost authority by limiting the responsibility of the local bishoprics in matters of moral theology and ecumenical relations. However, Rome's decisive resistance to modernity is most clearly revealed in its attitude towards developments in Eastern Europe.

## CONCLUSION

The twentieth century has seen major growth in the secular study of religions – non-theological in character and moving gradually from the description of social praxis and textual interpretations in the direction of anthropology. Religion is viewed less in terms of its messages or its relation to a transcendental reality, and more as a set of ritual observances whereby society sorts things out with itself. It is as though the analysis followed in the wake of the developing matter. One of the major consequences of this development – and there are other reasons underlying it also – is the very novel situation of Christianity, which occupies an ordinary place among the world's religions as one cultural fragment among others. This progressive levelling of the religious field creates the conditions for a fairer cultural partnership between peoples, in which non-Western ways of being modern and of democratic citizenship are rehabilitated or invented.

A gradual decline in the output of theological writings is becoming noticeable. The great voices of the first half of the century fell silent in the second, except for the voices – the stifled voices – of liberation theologies, without any ecumenically based theology really emerging. Is this perhaps an effect of the return to peace, of Third World issues being rapidly forgotten, and then of the world economic crisis? Or is it maybe a consequence of the subtle spread of a reformed, secularized mode of belief, which hands institutions over to civil society, while the spiritual bond becomes an inner one? The voices which do make themselves heard are more those of human compassion or ecological concern, people expressing a mystical inwardness or politico-religious dissidence. Religious thought, especially that of the monotheistic faiths, which is more linked to historical criticism, seems to be giving way to spiritualities that engage in the pursuit of inner happiness or an inchoate revolt, in a world increasingly split between a small, rich minority enjoying the benefits of modernity and, on the other hand, an immense impoverished majority that assembles fragments of encysted memory to denounce injustice or find liberation in the realm of the imagination.

The result has been a proliferation of observances in answer to the need to believe, which, for what are often contradictory reasons, has grown more acute, as though impoverishment, oppression and fear brought about a need for liberation through emotion shared within a community. Whether those communities are spontaneous, clusters of groups or sects, or institutional, developing within institutions or co-opted by them, they follow a particular path: traditional religions, unaffiliated believers, pick-and-choose belief systems. In those instances where a strong traditional religion prevails, these practices are disciplined or regulated with a firm hand, even if they make many concessions to the conditions of modern life. Otherwise, whether apocalyptic, millenarian or merely health-orientated, they often hide a fundamentalist conservatism beneath a cloak of authenticity.

Science and religion, those two great approaches to the mystery of the world, are no longer competing in quite the way they used to. Having revolutionized our lives in the last three centuries, science commands respect, and accordingly gives up the claim to have the final word and to exhaust the mysteries of humanity and the universe. The flourishing science of religions is no obstacle to the life of religious forms, to which it brings instruction and enlightenment. It firmly shows that tolerance is not a concession wrung out of religions, but ensues from their logical organization. It points out that, given the differences between them, the great religions of the world can only welcome and

comprehend the riches that all the other religions have to offer if they have a proper sense of intellectual and cultural pluralism and especially of the plurality of ways of thinking and believing.

The present moment, which seems to be one of confusion and often of faulty logic, heralds the emergence of a meaning. It involves mixing and plurality, the fact that we live, at least through communications, in many spheres at once and that we move around between those spheres. In fact, this plurality is one of the conditions of humanity and its creativity, and the representations of the divine emerging therefrom are now acknowledged once and for all to be partial and relative.

This acknowledgement of pluralism may induce religions to withdraw quietly from the field of domination. The Greeks understood that democracy entailed an attenuation of the status of the gods as sovereigns of a superior world, dominating humanity. If the slow twilight of the twentieth century's false images of the divine has made it possible to set human beings free while strengthening the bonds between them, the unsurpassed horrors which marked the century might enable us to glimpse the possibility that humankind, now at last emerging from the Stone Age, may attempt to write a new chapter of humanism in history, as a renaissance longed for by its most deprived members.

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# 23

## ETHICS

*Peter Singer*

### INTRODUCTION

We can understand the term 'ethics' either broadly or narrowly. In its broadest sense, ethics pertains to how we ought to live. Any discussion of values, of right and wrong, and of the resulting choices, can therefore be considered within the scope of the field of ethics. If we consider ethics in this sense, the discipline's history in the twentieth century is synonymous with the history of the century itself: that is, the development of the major political, religious and cultural ideas of the century, including the rise and ultimate fall of both fascism and communism, as well as the struggles over religious belief and secularism and over traditional village life vs. modern urban society.

There is also, however, a narrower sense of the term 'ethics', which refers to the attempt to gain a better understanding of the phenomena referred to in the previous paragraph. In other words, ethics in this narrow sense is not just any assertion or opinion about how we ought to live, but rather the systematic study of values and of theories about right and wrong, or of what is of ultimate value. Moreover, this systematic study is usually understood in a philosophical sense. It is not the work of the anthropologist or sociologist, documenting the way in which people in fact make moral choices. Rather it is the work of the philosopher attempting to justify a principle or set of principles that can guide our actions; or else perhaps – for there is no lack of sceptics about ethics – to argue why it is impossible to find any justification for choosing one way rather than another.

In this chapter, we will consider ethics in both senses, focusing primarily on the way in which the twentieth century has seen the emergence of new global ethical issues, but also examining the development of the systematic study of values and theories about right and wrong. These two threads converge, because in the final quarter of the century, philosophers and others studying ethics paid increasing attention to the practical ethical issues that we face, both as individuals and as a global community.

Ethics has a long history. It is to be found in every culture, and it is sometimes said that ethics is always related to culture. If this were so – if there were really no common ground between the ethics of China and France, or Nigeria and Argentina – then the history of ethics in the twentieth century would be the history of many different ethics, with no common pattern or mutual comprehension. But there are common themes to ethics in different societies. These themes draw on shared aspects of our nature, for example, the fact that we are social animals, living in groups but especially concerned with the welfare of our own kin.

This provides the background for the first theme of twentieth-century ethics, the endemic conflict between self-interest and the interests of the group or of others. This conflict has come to the fore as society stresses the ideal of the individual who achieves his or her goals in open competition with others. Thus throughout the history of ethics, some thinkers have sought to show that the good of the individual can only be furthered by doing what is also good in some larger sense, good for the community; while thinkers of a more sceptical frame of mind have doubted that this can be shown and have even charged morality with fraud for purporting to oversee the interests of the individual. The breakdown of traditional cultures in the twentieth century and the replacement of such cultures by an individualist society focused on consumption have made these debates all the more urgent. The twentieth century has produced larger and more anonymous urban societies than ever before, and in many countries, unbridled individual acquisition of wealth has become an acceptable ambition, if not the only one. In these circumstances, while the difficulties of living in such a society have shown how urgently a more ethical approach is needed, the very ability of any ethical standards to survive has been doubted.

Another perennial theme in the history of ethics that has emerged with new force in the twentieth century is whether ethics can be regarded as objective or subjective. These terms are used in different ways, but it is roughly accurate to characterize them as follows: objectivists hold that ethics is a matter of knowledge and some ethical judgments can be shown to be true, or in accordance with reason; subjectivists, on the other hand, see ethics as merely a matter of attitudes, or feelings, which can no more be true or false, or rational or irrational, than a preference.

Historically, religious belief has been a support for one form of objectivism, namely the view that the correct ethical

rules are laid down by God or the gods. With religion under more open challenge than ever before, and an increasing number of people for whom it has become irrelevant, it is not surprising that the twentieth century has seen a considerable rise in subjectivist ways of thinking. Nevertheless, defenders of objectivity in ethics are not lacking, even among those who are not religious, and the debate has been a vigorous one.

A third theme is that of technological development and the challenge it poses to some approaches to ethics. In the twentieth century, science and technology have raised a multitude of new issues. Should we accept new reproductive technologies that make it possible for infertile couples to have children? Is it right to transfer an embryo to the womb of a surrogate, who will give birth to a child to whom she has no genetic connection? Is it ethically permissible to alter the genetic code of living organisms? If so, does it apply only to alterations to the genetic code of non-human organisms or to our own genetic code as well? Must we use all the technological resources at our disposal to maintain the life of a human being who we know will never recover consciousness? Thus, science and technology challenge our old beliefs in the link between reproduction and sexual intercourse, in the randomness of natural reproduction, and ultimately in the sanctity of all human life.

The fourth and last theme is the expansion of the moral community. The nineteenth-century British historian W. E. H. Lecky described how ethics was previously limited to the family or tribe, but gradually expanded to include 'a class, then a nation, then a coalition of nations, then all humanity, and finally, its influence is felt in the dealings of man with the animal world'. There were times in the twentieth century when this idea has seemed naively optimistic. Opponents of any idea of moral equality beyond their own race fought a bitter struggle to maintain their superiority. But in the second half of the twentieth century, the defeat of explicitly racist governments has allowed this 'expanding circle' of ethics to resume something like the kind of progress that Lecky described. As the global community becomes more closely interconnected, and race and class cease to be accepted grounds for excluding someone from the sphere of morality, we appear to be closer to Lecky's penultimate step: a morality that is truly inclusive of all human beings. We are even taking the first tentative forays towards a wider ethic that includes non-human animals and the natural environment, as we will examine below.

## FROM 1914 TO 1945: SCEPTICISM AND COMMITMENT

As the nineteenth century closed, it was possible to believe that industrialization and the spread of education and science were bound to lead to steady progress not only in material prosperity and scientific understanding, but in ethics as well. Many of those who thought philosophically about ethics were also believers in progress, and this meant that they had to be objectivists, at least in the sense of judging the direction of change as progressing towards something better. Among these thinkers in the German tradition were Hegel and his followers, including even 'Leftist Hegelians' like Karl Marx, for whom the transition to communism was a change to a better society. In Britain,

the great English utilitarians, Jeremy Bentham, John Stuart Mill and Henry Sidgwick, all believed in the objective truth of the principle of maximizing pleasure or happiness and minimizing suffering. Darwin's theory of evolution also contributed to this sense of progress, for although Darwin himself declared the course of evolution to be ethically neutral, most of those who popularized his theories were not as scrupulous. Social Darwinism thrived especially in the United States, where it was used to show that the unrestrained competition unleashed by capitalism was a natural process that, cruel as it might seem, would ultimately lead to the evolution of a higher form of human existence.

The machine guns of the First World War killed European society's confidence in progress and objectivity in ethics, as surely as they killed the young men sent to the trenches. When the carnage was over, people rethought their ethical attitudes. In philosophical circles in Europe, *logical positivism* emerged from the Vienna Circle as the most influential new way of thinking about the world. Logical positivists accepted as meaningful only those propositions that could be verified by observation or were logical tautologies. Ethical judgments, it was immediately clear, were neither verifiable nor tautological. Hence they were rejected, either as nonsense, or as mere exclamations, or expressions of subjective feelings. Ludwig Wittgenstein, perhaps the leading philosopher of his generation, was linked with this view, although he sought to disassociate himself from the logical positivists and made clear his abiding respect for ethics. Yet at the same time, he insisted that we could not speak about ethics for whenever we try to do so, we run up against the limits of language.

Both this view of Wittgenstein and the influence of positivism supported the belief that ethics cannot be approached by reason. The ominous rise of fascism in Europe seemed to have confirmed this, for the fascists were quite open in their contempt for intellectuals and their preference for the instincts of the *Volk*, backed up if necessary by raw force. But by the 1930s, as conflicting ideologies confronted each other in Europe, those on the political left and centre who formed a common front against fascism developed a sense of commitment that made the academic arguments for or against subjectivism seem irrelevant. Although fascism had its coterie of intellectual supporters, including in Germany the philosopher Martin Heidegger, it had no body of theory that could compare with the writings of Marx and other socialists. Even political leaders like Lenin and Stalin wrote extensively and were presented by the communist movement as major thinkers. In Europe, North America and Asia, many intellectuals gravitated towards the left, and quite a few to communism.

The attitude of communism to ethics was paradoxical, and the roots of the paradox lie in Marx's own writings. On the one hand, Marx's materialist conception of history meant that ethics was part of the 'superstructure' of society, driven along by changes in the economic base. Hence 'bourgeois ethics' need not be taken seriously; it would disappear when capitalism collapsed, just as feudal ethics had disappeared with the passing of the feudal economy. But what then of 'communist ethics'? Was this just another ethic relative to a particular form of society, and not really superior to any other? If so, why should the workers struggle for the revolution that would bring about communism?

Marx's own approach to this paradox, at least in his later writings, was to consider himself as a scientist describing

the laws by which history works and able to discern that the collapse of capitalism and its replacement by communism was inevitable. On these grounds, both Marx and his twentieth-century followers castigated non-Marxist socialists who extensively debated the issue of socialist ethics; the Marxists considered irrelevant any discussion about the ethical superiority of a communist society. But to most readers, the denunciation of capitalism in Marx's *Capital* – especially in those chapters describing the exploitation of child factory-workers – was fuelled by a moral outrage at what the laws of the marketplace were doing to human beings. And Marx himself had – admittedly rather casually – remarked that the communist society of the future would be based on the principle of 'from each, according to his ability, to each, according to his need', and this certainly sounded like a principle of justice. This contradiction between deep moral commitment and an official stance that communism was based on science, not ethics, continued throughout the 1930s and beyond.

## Equality and human rights

The defeat of Nazism led to a reassessment of subjectivism. As journalists followed the Allied armies into the death camps, and the world began to realize the enormity of the atrocities committed, the subjectivist implication that Nazi morality cannot be said to be worse than any other morality – that all we can say, in effect, is that we do not like what they did – suddenly seemed hollow. Nevertheless, subjectivism of various kinds survived the Holocaust. On the European continent, and to some extent in the United States, existentialism flourished in both literary and philosophical circles. Its leading figures were French writers like Jean-Paul Sartre. Much of Sartre's thought is driven by the absence of God. Because there is no God, Sartre thought, we must abandon the idea that we human beings have been designed for some purpose. Therefore we have no essence: for humans, existence precedes essence – hence the label 'existentialism'. Because we have not been conceived by anyone for any purpose, we are free to choose our own purposes, and the only constraint on us is that we must choose 'authentically'. But what, many critics of the existentialists asked, if one makes an 'authentic' choice and leaps into the arms of Nazism? As the example of Martin Heidegger indicated, this was no idle question.

In order to try to show why an ethical choice had to be more than merely an authentic choice, philosophers began to struggle with ways of reasoning in ethics that could demonstrate a real difference between those who acted like Nazis and those who respected all humans equally. The most promising attempts all seemed to respond, in some way, to an appeal for a universal aspect of moral judgments. This is an ancient idea put forward in many cultures, including ancient China, and India, in Jewish and Christian thought, among the Stoic philosophers of the Roman Empire, and of course by the eighteenth-century German philosopher Immanuel Kant. In the twentieth century, it is perhaps most closely associated with the British philosopher R. M. Hare, who has argued that moral judgments are 'universalizable' prescriptions.

In effect, Hare's notion of universalizability means that I can only say – for example – 'We ought to go to war', and mean this as a sincere moral judgment, if I am prepared to put myself in the place of those affected by the decision to go to war, both for better and for worse. In putting myself in their position, I must take on their wants and desires. Then only if after having fully imagined the desires of all those people and weighed their desires alongside my own desires, I am still willing to prescribe the act of going to war, can I claim to be making a moral judgment when I say that we ought to go to war. Although there are many differences in style and substance between Hare and other leading contemporary moral philosophers, it is remarkable to note how many other moral philosophers have come up with a device that constrains our moral judgments in similar ways to Hare's use of universalizability. Jean-Paul Sartre himself in one lecture, 'Existentialism and Humanism' (1948), backed away from his earlier subjectivism and drew on Kant's idea that moral judgments must be universal in form.

In *A Theory of Justice* (1971), the most debated work of American ethics in the second half of the century, John Rawls introduces a 'veil of ignorance' so that the principles of justice can be chosen by people who do not know what position in society they will occupy. The German critical theorist Jürgen Habermas believes that judgments must be acceptable to an 'ideal speech community'. Utilitarians take it as axiomatic that each counts for one and none for more than one. Common to all of these devices is the idea of choosing, not just for yourself or for those close to you or like you in a certain way, but for everyone, no matter how different or remote.

It is not difficult to see how this approach to ethics is linked to the worldwide movement to combat racism (and later, other forms of discrimination too, for example against women). Racists would not wish to put themselves in the position of those they exploit or discriminate against. The whole point of racism (and sexism, and similar attempts to assert group superiority) is to identify the group to which one belongs, and mark it out as morally superior or more significant. Putting yourself in the place of your victims does not allow you to do that.

These philosophical developments had their parallels at state and international levels. The defeat of Nazism and the re-constituting of the League of Nations in the form of the United Nations Organization gave an impetus to the human rights movement. In Nuremberg, the allied court sitting in judgment on the German war criminals rejected the argument that the Nazis had been acting lawfully, in accordance with the laws that prevailed in Germany at the time. Instead they appealed to a higher law, a universal or natural law that could not be abrogated by any state or government. This made it urgent to say something about what the requirements of this law were. The *Universal Declaration of Human Rights*, adopted and proclaimed by the United Nations General Assembly in December 1948, though not legally binding on its member states, imposed a moral obligation on all United Nations members to achieve for their citizens the rights listed in the declaration. (Subsequently the International Covenant on Economic, Social and Cultural Rights, adopted in 1966 did attempt to give legal force to more specific rights.)

Perhaps the most widely accepted ethical standard was the rejection of racism. In the aftermath of Nazism, the evil of racism was so apparent that it was relatively easy to obtain almost universal agreement to the principle of non-discrimination on the grounds of race. National

independence movements that led to the end of white colonial rule over much of the developing world reinforced this opposition to racism. In India, the movement for independence was led by Gandhi, whose concept of non-violent resistance, based on traditional Hindu values, became a model for the American civil rights movement and subsequently for many other protest movements. By the end of the 1960s, only South Africa remained an overtly and officially racist society, and the exclusion of South Africa from international forums demonstrated the degree of consensus on this issue that prevailed in the rest of the world. At least, this consensus prevailed on an official level. In fact, racial problems did not go away, and even in countries like the United States, it was not until the civil rights movement of the 1960s, that racially discriminatory laws were removed from southern states.

The demand for equality, which had been accepted by major national and international bodies in respect of discrimination on the grounds of race and religion, proved impossible to limit to those areas. During the 1960s, women like Betty Friedan and Germaine Greer began to point out the extent to which every society, irrespective of its culture or religious tradition, was dominated by men. Feminism, which had been largely dormant since early in the century, when women obtained the vote in most democratic nations, underwent a major revival. In those societies in which feminist ideas were able to make some headway, the equality of women became an ethical issue not only at the level of government policy, but also in everyday life, as women increasingly questioned their assignment to domestic duties and their subordination to men. At the beginning of the new century, the ramifications of these changes are still unfolding, as more women enter leading positions in government and business, and a new generation of women grows up with ideas of sex roles that are very different from those with which their mothers grew up.

Other groups also made claims for equality and rights. In the face of opposition from many religious groups and other conservative moralists, homosexual thinkers like Dennis Altman made the case for gay liberation, insisting not only on the right to freedom from prosecution for sexual acts between consenting adults, but also demanding that they not be discriminated against on the grounds of their sexuality. The demand for human rights for the intellectually disabled was taken up by the United Nations General Assembly in 1971, when it passed the *Declaration on the Rights of Mentally Retarded Persons*, and more broadly in 1975, with the *Declaration of the Rights of Disabled Persons*.

Another question raised was whether it was not arbitrary to insist on rights and equality for all human beings, but to deny rights or equal consideration of interests to all those sentient beings outside our species, including animals in laboratories or intensive farms. From the late 1970s, through the 1980s, there was an unprecedented growth in support for the idea of animal liberation, or animal rights, especially in Europe, North America, and Australia. This led to some changes, particularly in the regulations governing experiments on animals, and in some countries, to the prohibition of the most restrictive forms of keeping animals. There was also a marked rise in the number of vegetarians in the developed nations. In the last decade of the century, an international group of distinguished scientists, philosophers and other scholars proposed that we should extend the rights to life,

liberty and protection from torture across the species boundary, at least to our closest relatives, the great apes.

## THE NUCLEAR AGE

The use of the atom bomb at Hiroshima and Nagasaki posed an obvious ethical question for all future generations (Plate 122). It is true that the bombing raids on Hamburg and Dresden, which did not involve nuclear weapons, killed more civilians than did the first two atom bombs. But gradually the realization dawned that these first two bombs were only the beginning and that nuclear weapons were developing to the point of potentially annihilating all human civilization. Albert Einstein, who had initially supported the development of the atom bomb because of his fear that Hitler might obtain it first, subsequently became a strong opponent of nuclear weapons. Many other scientists supported the Pugwash movement, which in a series of international conferences on science and world affairs warned of the threat of nuclear catastrophe. Never before had human beings had such a power or lived under such a threat. The ethical question that had to be faced was: can it be justifiable to use such terrible weapons of destruction?

The English philosopher Elizabeth Anscombe had a clear answer to this question. To use the deaths of civilians as a means of forcing the enemy to surrender or to use any weapon intended to kill civilians, she said, was murder. When President Truman was granted an honorary degree by Oxford University, Anscombe distributed an article denouncing him as a mass murderer. But her view gained little support from the English-speaking philosophical community, perhaps because at that time philosophers were, under the influence of the later work of Ludwig Wittgenstein, focusing more on linguistic analysis than on substantive ethical questions. It is true that Bertrand Russell, a major philosophical figure, dedicated himself to the anti-nuclear movement; but for most philosophers at the time this meant merely that Russell had abandoned philosophy to become a political activist.

Gradually the view came to prevail that the 'first use' of nuclear weapons, even in the midst of a war carried out by conventional weapons, would be wrong because no matter how limited it might be, it would carry the risk of escalation into a global nuclear exchange. Nevertheless it was not until the 1970s, when the NATO powers and the Soviet Union had built up huge arsenals of missiles with nuclear warheads, that a serious debate began about the entire strategy of basing a nation's defence on the threat of what was known as 'mutually assured destruction'. Granted that it would be wrong for any country to be the first to launch a nuclear attack, the question still remained: what about a retaliatory strike? Suppose, it was argued in America, that the Soviet Union did in fact unleash its nuclear missiles in a surprise attack, and this was detected by the American early warning system. There would still be no defence against the destruction of American cities and the loss of tens of millions of American lives. Would this justify the detonating of American nuclear weapons, with equally devastating consequences for Soviet citizens, who had had no say in the firing of Soviet missiles? And even if one were to ignore the deaths of millions of Soviet citizens, the additional nuclear radiation released by firing American missiles would only worsen the global crisis, perhaps triggering the 'nuclear winter' that some scientists

said would occur in any major nuclear exchange. The answer therefore seemed to be that the use of America's nuclear missiles could not be justified even if it were in retaliation for a first strike by the other side. But if it would be wrong to use these missiles, could it be right to base America's strategy on the threat to use them? The opposing sides were still locked in debate when the end of the Cold War came in the late 1980s. The preponderance of ethical opinion at the end of the century was perhaps sufficiently indicated by the award of the Nobel Peace Prize in 1995 to the long-standing anti-nuclear campaigner Professor Joseph Rotblat, followed by the 1996 verdict of the World Court that the use of nuclear weapons is contrary to international law. Despite this legal judgment and the end of the Cold War, the arsenals retained by the United States and Russia demonstrate that the threat of nuclear annihilation has not disappeared. Its place at the centre of public attention has, however, been largely replaced by other global dangers, less terrifying but in the long run perhaps no less threatening to the future of our planet, and certainly no less demanding of a co-ordinated and ethically sensitive solution.

## Environmental ethics

Rachel Carson's 1962 book *Silent Spring* is usually credited with triggering the environmental or 'green' movement. Carson focused attention especially on the pollution of soil and water by long-lasting insecticides, but environmentalists soon moved on to questions of wilderness and species preservation, population growth, the ozone hole, and the human-induced global warming. Each of these issues raises significant ethical questions, which affect all of humanity and cannot be solved without a global response. Thus they take the different nations of the world a step closer to the development of a global ethical community.

In the discussion of the preservation of wilderness and endangered species, there were many calls for a new environmental ethic. Traditional ethics, it was said, are always human-centred. If we want to conserve a forest or a wetland then we must, if we are to make sense within a traditional ethic, argue that it is valuable for humans perhaps because we may find plants there with special medicinal properties or because we can go there and refresh our spirit by communing with nature. But, the advocates of a new environmental ethic urged, some things are of value in themselves, independently of whether human beings value them or ever will value them. Our ethic should not be human-centred and short-term, these environmentalists argued; if our planet is to survive, we need an ethic that is eco-centred and long-term. It was from discussions like these that a new sub-discipline of ethics, environmental ethics, was born, to grapple with, for example, questions about the value of preserving a species of fish that lives in a free-flowing river that the government or some other authority would like to dam, or the value of a forest wilderness as compared with the economic value of the timber that could be obtained by cutting it.

Although the threat of global overpopulation had been noted by Thomas Malthus in the eighteenth century, it was only in the twentieth century that this threat began to be taken seriously by governments. Even then, in the first half of the century, many countries sought to increase their population in the belief that this would enhance their military and economic strength. This attitude was reversed in the last quarter of the century, when the world's population reached 5 billion, and many countries with high birth rates began actively to discourage population growth. The strongest action was taken by the world's most populous country, China, which adopted a 'one child policy'. Attempts to reduce population growth inevitably met with opposition from those who based their ethics on particular religious beliefs. The Roman Catholic Church, for example, opposes the use of contraception or abortion. It recommends instead the use of abstinence during the fertile period of a woman's cycle. Some Islamic nations have taken a similar stance. For this reason, the 1994 International Conference on Population and Development, held in Cairo, proved to be a forum for a significant confrontation between nations that favoured a secular, or liberal religious view, and those that formed their views on the basis of traditional religious beliefs. Some Latin American Catholic nations and some Islamic nations united to oppose the inclusion in the conference communiqué of references to the termination of pregnancy, in particular; but the overwhelming majority of the nations of the world stood firmly behind the need for strong measures to reduce global population growth, and especially to educate women and to give them control over their fertility.

Whether it will be possible to reach equally broad agreement on measures to prevent global warming is, at the time of writing, more difficult to say. The 1992 United Nations Conference on Environment and Development was informed by panels of scientists that the increasing production of carbon dioxide, associated with higher energy consumption, especially from the burning of coal and oil, is bringing about global warming. This will cause widespread changes in climate patterns, including droughts and famines in some areas, and floods in others. It will also bring about a rise in sea levels that could wipe out some low-lying Pacific island nations and inundate the delta regions of Bangladesh and Egypt, which are home to more than 40 million people. This threat led to the signing of a Climate Change Convention, which proposed a cutback in carbon dioxide emissions. But some nations – the United States, Australia, Canada, Russia and certain European countries – have per capita emissions of greenhouse gases that are as much as six times higher than other nations, such as India and China. So it would seem fair for those nations to roll back their greenhouse gas emissions rapidly, while developing nations are allowed to continue to increase theirs. The developed nations are reluctant to embrace a solution that would cause significant, if temporary, disruption to their economies. Here the need is apparent for the world to work out a just solution to a novel problem. The ability of the atmosphere to absorb greenhouse gases while remaining climatically stable is a common resource. The oceans, too, are another common resource, subject to pollution from individuals and corporations from many different nations. If the world community does not find and accept basic ethical standards for the use of these common resources, it is frightening to contemplate the possible consequences.

## Ethical issues raised by medicine and biological sciences

The twentieth century has seen an extraordinary increase in our knowledge of biological processes and in the ability of

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medicine to prolong life; but this has brought a host of new ethical problems in its wake, and has caused serious difficulties for traditional approaches to questions of life and death. The study of these ethical issues, known as bioethics, has grown rapidly. In the 1950s, there was almost no systematic study of new ethical issues in medicine or the biological sciences, but by the 1990s, there were hundreds of centres or departments of bioethics, not only in Europe and North America, but throughout the world, especially East Asia, South America, and Australia.

One early example of the kind of issue that led to this development was the definition of death. Traditionally, death had been defined in terms of the cessation of heartbeat and circulation; but during the 1960s it became common to use a mechanical respirator to maintain the breathing of patients who would otherwise die. Some of these patients, of course, made good recoveries; but among them were some who had suffered such severe head injury that the brain had irreversibly ceased to function. Was it permissible, doctors asked, to remove patients from the respirator? The question developed a new urgency because of another medical innovation, the technique of transplanting an organ from one person to another. Organs such as the heart became damaged if circulation ceased; but if death could be redefined as the irreversible cessation of all brain function, then these organs could be removed from patients while circulation continued and used to save the lives of other patients. By the 1990s, most of the world's nations accepted the new definition of death.

In a manner that is illustrative of the constantly shifting frontier of this field, questions were then raised about patients who have irreversibly lost consciousness, but still retain some brain functions. In some hospitals, especially in the United States, such patients may be kept alive for many years, whereas in other countries infections are deliberately left untreated, or feeding tubes are removed, and the patient soon dies. This mode of treating a patient is based on a distinction between actively taking life and omitting to preserve life. Some ethicists consider that the latter is acceptable, whereas the former is not, but others deny that the distinction is ethically significant.

The absolute wrongness of taking human life has also been put in doubt by increasing support for the idea that when a patient is terminally ill and asks a doctor for assistance in dying, the doctor is justified in providing such assistance. Throughout the century, there have been advocates of the legalization of voluntary euthanasia, but until the 1980s, this advocacy had met with no success. In that decade, however, courts in the Netherlands began to uphold the right of a doctor to provide assistance in dying to a patient who is terminally ill, finds his or her condition unbearable, and makes a persistent, well-informed and rational request for euthanasia. It has been reliably estimated that about 2,300 deaths each year in the Netherlands are the result of voluntary euthanasia. Widespread popular and medical support for this practice in the Netherlands has led to similar proposals being discussed elsewhere, and in 1995 the Legislative Assembly of Australia's Northern Territory became the first parliament in the world to vote for the legalization of voluntary euthanasia.

At the other end of life, there have also been intense ethical debates about new reproductive technologies. In 1978, Robert Edwards and Patrick Steptoe succeeded in fertilizing a human egg outside the body, and transferring the embryo to the womb of the infertile woman who supplied the egg. The resulting 'test-tube baby' made world headlines. It was ethically controversial for several reasons: it was based on experimentation on human embryos, which some saw as having a right to life; there were fears that it would produce abnormal babies; it opened the way to further new developments, such as the donation of eggs from one woman to another, and the long-term storage of frozen embryos; and it could lead to the selection or genetic manipulation of embryos and hence of human beings.

Many governments set up committees of inquiry into the ethical, social and legal aspects of in vitro fertilization, as the technique was called (Plate 123). In general, these official bodies approved the procedure, under certain conditions. Most allowed some experimentation on human embryos, with some consensus on a limit of 14 days after fertilization for such experiments. Within a decade, in vitro fertilization had become a standard clinical procedure for assisting infertile couples. Fears about a high rate of abnormal babies receded, but controversy remained, especially when the technique was used to help women in their fifties and even early sixties to have children.

Concerns about possible future uses of new reproductive techniques for eugenic purposes also remained. The celebrated discovery by Crick and Watson of the structure of DNA had led, within a 30-year period, to the capability of manipulating the genetic code of living organisms in certain ways. This new control over the design of living organisms was itself the subject of fierce ethical debate, even when applied only to micro-organisms. In the 1980s, the first experiments on genetically engineered plants and animals were carried out (Plate 124), despite objections that this could lead to new and environmentally damaging organisms 'escaping' to the wild. There was also speculation that genetic engineering techniques would eventually be applied to human beings. This speculation was further fuelled by the human genome project, an international project, described as the biological equivalent of sending an astronaut to the moon, which set out to map and sequence the entire human genome, or genetic code. The resulting knowledge, it was hoped, would provide a basis for treating the cause, rather than the symptoms, of many diseases. But critics insisted that while this may be so, it would be impossible to prevent abuses of this knowledge, for example, genetic intervention designed to produce 'superior' human beings. They also pointed to possible misuse by employers or insurance companies, who may wish to screen out prospective employees or clients with undesirable genetic traits.

## A global ethical community

As the twenty-first century begins, the ethical problems we face seem far more daunting than those at the dawn of the last century. War and poverty have not been abolished, and in addition the new powers we have developed pose previously undreamed of threats to the future of all life on this planet.

Yet at the same time there are hopeful signs. The nations of the world are no longer divided into two opposing camps, as were most of the leading powers for much of the twentieth

century. The human rights movement remains strong, although there continue to be cultural differences about the extent to which individual rights are to be placed above the interests of the community. In the United States, for example, the Constitution is based on the Bill of Rights, which in turn derives from John Locke's view that lawful government can only arise from a social contract in which individuals give their consent to the form of a government, while retaining certain rights against that government. In contrast, the Confucian ethic, which has influenced China, Japan, Korea and Singapore, sees the individual as only a part of a larger unit: the family and, by extension, the whole society.

Most promising of all recent developments, perhaps, is the growing willingness to address humanitarian issues, no matter where they occur. In the early 1990s, the developed nations attempted to provide humanitarian assistance in Bosnia, Somalia, and Rwanda (Plate 125). Although none of these attempts can be regarded as an unqualified success, they showed a determination not to let large numbers of people starve or die from epidemics when help can be provided. They can perhaps be seen as a response to the fact that modern telecommunications have created a 'global village', bringing the plight of other human beings into the living rooms of the entire world. The challenge now is for the global village to evolve into the global ethical community, which will be required if we are to solve the global problems of the present century.

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# PSYCHOLOGY

## *Hans Pols*

Psychology is the science of human nature. Nowadays, many individuals expect psychologists to provide guidelines for normal and acceptable behaviour. A great number of people make sense of their lives by referring to psychological concepts. Many psychologists are convinced that their discipline has supplanted philosophical, religious, and moral conceptions of human nature. In reality, however, psychologists have always revised their theories. This has, at times, placed the discipline at the centre of controversy. Psychological explanations tend to emphasize individual factors and marginalize social and cultural factors. Such explanations are more acceptable in Western societies with their high degree of individualism. They appear inappropriate in societies whose individuals explain their behaviour in terms of tradition, cultural heritage, or bonds to one's extended family or social group.

Psychology is a fragmented discipline. It has a wide variety of historical roots, many different models of human nature, and several research methods. In this chapter, three main approaches within psychology are presented: experimental psychology, mental testing, and psychotherapy. The relationship between these approaches has always been contentious as they embody different perspectives on the nature of psychology as a scientific discipline, its social function, and the nature of its applications. Experimental psychology is practised in university and industrial laboratories, mental testing generally takes place in schools, while psychotherapy is conducted in clinical settings. The fact that these three main approaches have been incorporated within one academic discipline is the result of historical contingencies.

## EXPERIMENTAL PSYCHOLOGY

The roots of experimental psychology must be traced back to the German universities of the second half of the nineteenth century. During this period, pioneering psychologists were convinced that their discipline had to emulate the scientific standards of physics and chemistry and therefore conducted their research in laboratories. To these early psychologists, methodological rigour was more important than practical utility. German experimental psychology set the standard for the new discipline, particularly in North America. Experimental psychology was characterized more by an adherence to specific research methodologies than to specific theories and models. This emphasis was due to the attempts of psychologists to differentiate their discipline from philosophy, from which psychology originally evolved. Initially, psychologists attempted to answer philosophical questions with the experimental methodology of science.

### Wilhelm Wundt's physiological psychology

Experimental psychology is generally considered to have been born in 1879 when Wilhelm Wundt (1832–1920) established his laboratory in Leipzig, Germany. In his textbook on psychology, Wundt summarized relevant contemporary research on the subject. He published *Principles of Physiological Psychology*, the first comprehensive textbook of the new discipline, in 1874 and founded *Philosophische Studien*, a journal devoted to psychological research in 1881. Scientists from all over the world visited Wundt's laboratory, which became the prototype for the psychological laboratories they established in their home countries.

Wundt named his approach *physiological psychology* because he adapted research techniques from physiology to study the mind. The two basic elements of his programme were psychophysics and mental chronometry. Psychophysics investigated the relationship between the objective world of physics and the subjective world of human experience. Physicists in the nineteenth century had described light and sound as wavelengths of specific frequencies. Physiologists then investigated how the sensory system transformed external physical stimuli into conscious experience. Psychologists concluded that the transformative powers of the mind obeyed general laws. For example, experiments demonstrated that when the brightness of a light-flash increased in geometrical progression, its perception increased in arithmetical progression. The same principle applied to the perception of sound and weight. Mental

chronometry involved reaction-time experiments. In a typical experiment, a person was asked to press a button as soon as he or she observed a flashing light. Wundt assumed that the time lag between the appearance of the light and the person's reaction constituted the time needed for the mental processes involved in acting upon a discrete perception. Wundt then complicated the task by adding discrimination and decision factors, which increased the reaction time. By presenting a great variety of mental tasks, Wundt hoped to determine the reaction times needed for the various mental processes involved in their execution.

Edward B. Titchener (1867–1927) considered himself Wundt's sole faithful disciple in North America even though his approach was more limited. Titchener's programme, known as *structuralism*, entailed the systematic analysis of consciousness into its constitutive elements through introspection under rigidly controlled laboratory conditions. According to both Wundt and Titchener, there were strict limitations to what laboratory research could accomplish because only relatively basic mental processes were amenable to experimental research.

A group of German psychologists unified in the Gestalt School, inspired by holistic philosophical ideas, criticized this atomistic approach to mental phenomena.[1] They disagreed with Titchener's conception that human experience was assembled from thousands of basic elements synthesized by the mind, arguing that experience is perceived as a whole. They demonstrated, for example, that when two lines were flashed in rapid succession, they were perceived as a single moving line. This phenomenon of apparent motion was fundamental for the perception of films as continuous 'moving pictures'. Other alternative approaches to Wundt's experimental psychology were developed to investigate higher mental processes such as thinking, problem-solving, and memory. A number of North American psychologists also reacted against the approaches of Wundt and Titchener as they considered its parameters too narrow, providing no basis for practical applications.

## FUNCTIONALISM

Around the turn of the twentieth century, *functionalism*, an alternative approach to psychological research, was formulated by a group of North American psychologists. The main protagonists of this approach were John Dewey (1859–1952) and James Rowland Angell (1869–1949). Functionalist psychologists were not particularly concerned with the structure of the mind or the constitutive elements of consciousness. Inspired by the evolutionary theories of Charles Darwin (1809–1882), they endeavoured to investigate the function of mental activity both in the evolution of the human species and in the adaptive relationship of individuals to their social environments. Strongly inspired by the American philosophy of pragmatism, functionalists were deeply interested in the practical applications of psychological research, such as mental testing and educational psychology.

Functionalist psychologists interested in child development focused on how children learned to adjust to their environment while growing up. This perspective enabled investigators to study the origins of several mental and behavioural characteristics in the development of the human personality. Research in developmental psychology was conducted by Granville Stanley Hall (1844–1924) and James Mark Baldwin (1861–1934) and later continued by the Swiss psychologist Jean Piaget (1896–1980). Within an evolutionary framework, research on animals was considered relevant to psychology because certain animal species (such as white rats, cats, dogs, pigeons) displayed elementary characteristics of learning that were shared with human beings. During the 1910s and 1920s, psychologists increasingly focused their research on learning in human beings and animals.

## BEHAVIOURISM

The school of behaviourism, initiated by John B. Watson (1878–1958), dominated North American psychology from 1920 to 1960. According to Watson, who had studied with Dewey and Angell, psychology's aim as a purely objective branch of natural science was the prediction and control of behaviour, which he regarded as entirely determined by environmental factors. Because he was convinced that psychologists could only study objectively observable behaviour, Watson argued that the study of consciousness through introspection fell outside the scope of the discipline. Watson believed that the principles governing the behaviour of humans and animals were essentially the same. He and his followers conducted most of their research on animals because fewer complicating factors were involved.

Watson was influenced by the experiments on animal behaviour conducted by the Nobel-prize winning physiologist Ivan Pavlov (1849–1936) and made this work the foundation of his own theories. Pavlov had conditioned laboratory dogs to salivate at the sound of a bell by repeatedly sounding this bell just before presenting food (Plate 126). Pavlov called the innate and automatic digestive response of salivating the unconditioned reflex, and the response acquired through repeated experience the conditioned reflex. He investigated the conditions necessary for establishing conditioned reflexes, their strength, and the period of time that elapsed before they disappeared (extinction). According to Watson, conditioned reflexes were the constitutive elements of habits, which, according to him, were the building blocks of human behaviour. In this perspective, the formation of habits and the establishment of conditioned reflexes could potentially explain all human behaviour.

Watson asserted that behaviour was based on three innate, primary emotions: fear, rage, and love. The subtleties and variety of adult emotional expression were derived from these basic emotions through elaborate conditioning processes. He became notorious for illustrating this theory by experiments involving an eleven-month-old boy, later named Little Albert, in whom he conditioned a fear of white rats by striking a metal bar with a hammer when the boy showed an interest in the animal. By pairing the presentation of the rat with a loud noise on successive occasions, Little Albert became frightened upon seeing the rat even when the loud noise was absent. The child had developed a strong fear response to other white furry objects as well, including rabbits, dogs, cotton wool, and a seal coat.

The behaviourist school gave rise to several experimental traditions generally labelled neo-behaviourism. One of its most influential protagonists following the Second

World War was B. F. Skinner (1904–1990), who modified Watson's scheme of conditioned reflexes by introducing rewards as a motivating force for behaviour. According to Skinner, Watson's model assumed a passive organism merely reacting to changes in its environment. Instead, Skinner claimed that organisms actively learn by seeking rewards. To test his theories, he developed the 'Skinner box'. Animals placed in these boxes learned by random exploration that specific actions, such as pressing a bar or pecking at a coloured spot on the wall, led to rewards (such as receiving a pellet of food). After they had learned the specific mechanism of the Skinner box in which they had been placed, animals repeated the response, which had previously been reinforced by a reward. Skinner called this procedure of shaping behaviour through rewards *operant conditioning*. In other experiments, he investigated the effects of different reinforcement schedules on the speed of learning and the persistence of acquired behaviour patterns.

Behaviourism has been praised for its optimism in claiming that virtually all behaviour is learned and can therefore be modified by using appropriate training and rewards. But it has also been criticized for inspiring the manipulation of human beings and for excluding a great number of psychological phenomena, such as cognition and human experience, as appropriate topics for research. Although behaviourism dominated psychology for four decades, alternatives remained viable. Gestalt psychologists, for example, conducted experiments demonstrating the importance of insight as a factor in learning. In the 1960s, experimental psychologists transcended some of the restrictions imposed on the discipline by behaviourism by investigating mental processes.

## COGNITIVE PSYCHOLOGY

In the late 1950s, the linguist Noam Chomsky claimed that the linguistic abilities of human beings could not possibly be explained by behaviourist principles such as reinforcement and selective extinction. He proposed the theory of *transformational generative grammar*, which suggests the existence of innate rules and principles governing the way the mind operates. Chomsky's assertions inspired the tradition of cognitive psychology, which investigates phenomena such as perception, attention, reasoning, problem-solving, language processing, and the organization of memory.

Cognitive psychologists view human beings as information processing systems and investigate the analogies between human cognition and computer technology.[2] They define thinking as the systematic manipulation of symbols. Computers process information by transforming input through processes of encoding, storage, and retrieval, providing a specific output. In their research, cognitive psychologists have differentiated between sensory memory, short-term memory, and long-term memory, each operating according to its own principles. Encoding takes place in humans via sensory memory as, for example, pattern recognition, while storage and retrieval are processes constituted by interactions between short- and long-term memory.

Cognitive psychologists have developed numerous computer simulations of cognitive functioning. Recently, they have started to apply neurophysiological research methods such as magnetic resonance imaging (MRI) techniques to study the neurological processes underlying specific cognitive processes.

## SOCIAL PSYCHOLOGY

Social psychologists study how human beings function in small groups. Social psychologists have developed entirely different methods for their research. Solomon Asch (1907–1996) devised several experiments to investigate the effects of peer pressure and social conformity. In what was presented to a group of individuals as a visual discrimination task, Asch asked participants to identify the longer of two lines presented on a screen. However, all participants except one were accomplices of the experimenter. When they collectively gave the obviously wrong answer, most uninformed participants tended to vote with the group despite their awareness that the answer was incorrect. If only one of the other individuals gave the right answer, most participants were able to uphold their own opinion. On the basis of these experiments, Asch drew some troublesome conclusions about the power of social pressure in, for instance, politically repressive regimes.

In what became a very influential experiment, Stanley Milgram (1933–1985) asked individuals to participate in a behaviouristic learning experiment where they were told to administer electric shocks to a student when he made mistakes during a straightforward learning task. The student, who was located in another room so that subjects could only hear him, was an accomplice of the experimenter. In reality, no shocks were administered; the student only acted as if there had been. Milgram reported that when he ordered the research participants to administer increasingly high electric shocks, most of them complied. Many participants even administered lethal shocks when ordered to do so. The implications of these experiments were profoundly disturbing and led to extensive discussions about the nature of human morality and responsibility.

Experimental psychology originated in Germany but flourished in the United States. However, only a relatively small number of psychologists have been and are currently involved in laboratory research. The majority of psychologists specialize in the development and application of mental tests and in psychotherapy.

## MENTAL TESTS AND THE PSYCHOLOGY OF INDIVIDUAL DIFFERENCES

The mental test is by far the most widely used tool developed by psychologists. Psychologists have designed tests that measure intelligence, personality characteristics, and specific abilities and aptitudes. Many individuals encounter mental tests while in primary school or as part of an application procedure. Psychologists interested in mental tests want to measure individual differences instead of investigating the general laws governing human nature. Test psychologists are generally practically oriented; they develop tests for use in vocational guidance, selecting and placing job applicants, and placing schoolchildren into appropriate educational tracks. Given their interests in individual differences and practical applications, test psychologists form a sub-group within the field of psychology.

Intelligence tests have been highly controversial because a number of test psychologists have claimed that intelligence is a single, measurable, inherited, and stable quality that determines an individual's potential for success in life. Several psychologists have claimed that racial and ethnic groups other than those of European descent are, on average, less intelligent. Other test psychologists have made similar claims about individuals from less privileged social backgrounds. Critics of intelligence tests have argued that these tests are culturally and racially biased. Instead of measuring intelligence, they indicate level of education, social privilege, and conformity to specifically Euro-American standards.

## Intelligence tests

Around the turn of the century, several countries in Europe and North America passed universal primary education laws, mandating that all children attend school for a minimum number of years. As a consequence, children from radically diverse social backgrounds and aptitudes were placed in the same classroom, giving greater visibility to pupils with learning disabilities or mental handicaps. In response to a request from the Paris Board of Education, Alfred Binet (1857–1911) and his colleague Théodule Simon (1873–1961) designed the first intelligence test in 1905 to identify pupils in need of remedial education.

This test, which was administered individually to pupils who could not keep up with the curriculum, provided a number corresponding to the mental age of schoolchildren relative to their chronological age. Very soon, the concept of mental age was replaced by that of the intelligence quotient (IQ), which was defined as equal to a child's mental age divided by his or her chronological age multiplied by one hundred. The average intelligence score was therefore defined as 100.

Research into the nature of intelligence became the lifework of Charles Spearman (1863–1945), the first psychologist to receive an appointment at a British university. Spearman analysed the test scores of a large number of individuals on a variety of mental tests using his statistical technique of factor analysis. According to him, all intelligence tests, despite the fact that they measured different mental abilities, produced comparable results. Individuals who scored high on one test tended to score high on all other tests; conversely, those who scored low on one test also tended to score low on all the others. On the basis of these statistics, Spearman concluded that all intelligence tests measured an inherent quality of general intelligence, which he conceived of as a single measurable quality and equated with general mental energy.

Spearman's approach was further developed by his successor Cyril Burt (1883–1971), who translated the Binet-Simon test into English and made it available for use in the British educational system. Burt defined intelligence as innate general cognitive ability, a stable characteristic in individuals explaining differences in social class, educational achievement, and income. Since he considered the level of intelligence in individuals virtually unalterable, the quality of education received did not influence their later success in life. In Burt's views, a child's innate capacity set definite limits to what he or she could achieve. According to Burt, educational administrators only needed to measure the intelligence of children in their charge and provide them with an education compatible with their ability. Burt advocated placing of schoolchildren in different secondary schools based on their scores on intelligence tests, a practice which was institutionalized in Britain until the 1960s. In order to support his views, Burt initiated an ambitious research project testing the intelligence of twins who had been raised separately. Such twins, Burt argued, had been raised in different environments but had exactly the same genetic endowment. The results of this study confirmed Burt's ideas. However, later inquiry revealed that some of his data were fabricated.

A number of American psychologists adapted intelligence tests for use in the army when the United States entered the First World War in 1917. Psychologists aided in the selection and placement of inductees by testing their mental abilities. For this purpose they developed written tests that could be administered to groups. Never before had such a large number of individuals, about 1.75 million army recruits, taken intelligence tests. Psychologists felt that this project helped them to gain public recognition, although army officers did not pay much attention to the test results. Moreover, it took several years to analyse the data, which yielded rather controversial conclusions. According to psychologist Carl C. Brigham, the results proved that the great majority of American soldiers had the intelligence of thirteen- or fourteen-year-old children. Additionally, the results showed that white, Anglo-Saxon men had the highest intelligence scores while recent immigrant groups and African-Americans scored, on average, significantly lower. At the time these psychologists did not consider the possibility that cultural and linguistic differences in addition to the level of education attained were responsible for these differences.

On the basis of his experience in the army project, Lewis M. Terman (1877–1956) further developed the intelligence test for use within the American educational system. Terman was not particularly interested in diagnosing mental retardation and developmental disabilities. Instead, he recommended that whole school populations be tested and individual pupils placed into different curricula according to the results. Terman's version of the intelligence test, the Stanford-Binet test, has become the most widely used intelligence test in North America. It served as the prototype for intelligence tests worldwide. Because Terman espoused the view that intelligence was inherited, he advocated immigration restrictions to limit the entrance of those ethnic groups which he considered to be of inferior intelligence to the United States.

Psychologists advocating the use of mental tests have argued that intelligence tests measure general cognitive ability, which is largely innate. The use of mental tests in schools purportedly reduced prejudice and made educational administration more objective as pupils were placed in schools based on ability rather than on social background. However, the psychologist Louis Leon Thurstone (1887–1955), using statistical techniques very similar to those developed by Spearman and Burt, argued that there were several primary mental abilities instead of a singular general intelligence. Thurstone argued that the use of a single test score as an indication of intelligence was highly misleading.

Other psychologists have criticized the dubious nature of some of the research that led to the more controversial psychological theories of intelligence. Kamin, Lewontin

Rose and Gould have argued that intelligence tests merely measure social privilege and educational background. According to them, the widespread reliance on intelligence tests has only reinforced unequal access to education. Mental tests generally consist of items familiar to those who have been educated by Western European or North American standards and are often presented in English, thus favouring English native speakers. Individuals of Euro-American descent have therefore consistently scored the highest. These results, however, do not suggest the racial and ethnic inferiority of non-Euro-Americans but only indicate the way in which intelligence tests were devised. The translation and use of intelligence tests in other countries without significant modifications often leads to inappropriate results. Recently, some psychologists have attempted to develop 'culture-fair' intelligence tests that do not favour individuals from specific cultural or national backgrounds.

### Personality tests

Psychologists have also developed tests that measure personality characteristics. The work of the British psychologist Hans J. Eysenck (1916–1997) has been particularly influential. Eysenck believed that most personality characteristics were highly stable during the lifespan. Using the statistical techniques developed by Spearman and Thorndike to analyse the results of various types of personality tests, Eysenck concluded that there are four dimensions to the human personality: intelligence, introversion versus extroversion, neuroticism, and psychoticism. Eysenck developed several personality tests to measure these characteristics. Several other psychologists, using slightly different statistical techniques or employing different theoretical perspectives, have defined other dimensions of personality.

In the United States, the Minnesota Multiphasic Personality Inventory (MMPI) was published in 1943, after more then ten years of research. This test was developed with the purpose of identifying the presence of psychological disorders to aid clinical psychologists. It is still used as a diagnostic tool today. The MMPI contains 550 test questions, which, after statistical analysis, yield scores on scales measuring depression, paranoia, psychopathic deviance, and other clinical syndromes as well as scales measuring masculinity-femininity and social introversion. Several variations of these clinical tests, each measuring particular clinical syndromes, have subsequently been developed. Of particular interest due to its widespread use and popularity is the Rorschach test, which consists of pictures of ink-blots. Individuals are asked to report what images they see in these ink-blots. Their responses are supposed to reveal unconscious mental processes, which have been projected onto the figures shown.

### DEVELOPMENTAL PSYCHOLOGY

The Swiss psychologist Jean Piaget (1896–1980) started his career standardizing the French translation of one of Burt's tests with Simon in Paris. Piaget found mental tests superficial because they measured intelligence quantitatively whereas he was far more interested in the qualities of the

cognitive processes that lay behind the answers given to specific test questions. Piaget's research demonstrated that the way children think changes qualitatively as they mature. Piaget's developmental epistemology described the unfolding of the cognitive abilities of children through four major stages: sensory-motor, pre-operational, concrete operations, and formal operations.[3] Each of these stages was characterized by specific cognitive structures and could be defined by the tasks children were able to complete successfully. Children move to the pre-operational stage around the age of two when they acquire a sense of object permanence, that is, when they recognize that an object still exists even though they can no longer observe it. Around the age of five, children progress to the stage of concrete operations when they recognize the conservation of quantity. Prior to this, children generally assume that the amount of liquid increased when it was poured into a taller and thinner glass since the fluid rose higher. Around the age of eleven, children are normally able to think logically without referring to specific situations and events.

Piaget's work has been of great interest to educational psychologists who have argued that school curricula should be adapted to reflect the cognitive development of children. Piaget's work has been incorporated in teacher education programs worldwide. His theories have been tested in several cultural contexts, but such investigations have cast considerable doubt on the universality of the developmental stages outlined by Piaget.

### CLINICAL PSYCHOLOGY AND PSYCHOTHERAPY

Today, most psychologists work as clinical psychologists providing psychotherapy to individuals, couples, and families in need of expert guidance. Psychotherapists aid individuals in gaining a clearer understanding of themselves, which equips them to better cope with the challenges of life. Clinical psychologists form the third group of practitioners within the discipline of psychology. Initially, psychotherapy was practised only by physicians, many of whom were inspired by the psychoanalytic theories of Sigmund Freud. Only after the Second World War did psychologists begin to provide psychotherapy.

### PATHOLOGICAL PSYCHOLOGY

In France, the earliest psychologists were fascinated by abnormal mental states, of which multiple personality was the most intriguing. In this country, psychology developed alongside medicine, in particular psychiatry. Psychological theories of the abnormal mind were modelled on medical views of mental disorder. Pierre Janet (1859–1947) called his approach, which relied on clinical case studies of individuals as examples of psychological abnormality, *pathological psychology*. Janet defined psychology as the science of consciousness and its laws, and was particularly interested in subliminal and altered states, among them hypnotic trance, hallucinations, somnambulism, hysteria, reveries, dreams, and delirium. He believed that altered mental states provided a much more profound insight into human nature than could the conscious individual on the basis of self-reflection. According to Janet, unconscious

aspects of the human psyche were far more important than conscious ones. Janet is well known for his research in the repression of memories related to traumatic events. Hypnosis proved to be a successful means of accessing memories which had become unconscious through the process of dissociation.

## SIGMUND FREUD AND PSYCHOANALYSIS

Sigmund Freud (1856–1939), the founder of psychoanalysis, is without question one of the most influential thinkers of the twentieth century. Freud's work has been said to represent the last of three intellectual revolutions that have irrevocably changed modern human thought. First, Copernicus asserted that the Earth was not the centre of the universe. Subsequently, Darwin placed human beings at the end of the process of evolution, emphasizing the similarity of humans to animals. Finally, Freud debunked the prevailing belief in the superiority of reason by stating that human beings were driven by unconscious motives. Freud's ideas have informed conceptions of selfhood and identity, and have been incorporated into popular culture.

When Freud opened his private practice in 1886 in Vienna, Austria, he specialized in treating patients suffering from nervous disorders, of which hysteria was the most pronounced. Hysteria had been treated without much success by physicians because it was based on psychological distress rather than physiological disturbance. In 1885, Freud visited Janet's teacher, the French physician Jean-Martin Charcot, who had become famous for his efforts to study hysteria using hypnosis. Charcot considered hysteria to be a special pathological condition of the central nervous system. When he returned home, Freud learned that it was often possible to retrieve repressed memories of traumatic events in his patients without the aid of hypnosis. Through this experience, he became convinced that hysterics suffer mainly from reminiscences. Soon, he replaced hypnosis with the method of free association during which patients were instructed to speak freely and refrain from self-censorship in order to uncover emotionally charged memories. Freud then applied what has been called the 'talking cure': when his patients related and thereby re-experienced previously repressed memories of traumatic events, their symptoms subsided.

Freud developed an elaborate theory of the human personality on the basis of his clinical experience and refined it throughout his life. On the basis of his earliest experiences with psychotherapy, he inferred the existence of the unconscious and the mechanism of repression, which were essential elements of the dynamics of the human personality. Later, Freud claimed that most emotional conflicts were related to the desire to fulfil infantile wishes for sexual gratification. Because such wishes were socially unacceptable they provoked strong feelings of anxiety that were almost immediately repressed. As a consequence, such wishes could be expressed only indirectly, in the form of dreams, neurotic symptoms, odd behaviour, or personality traits. Repressed emotions and wishes were uncovered through free association, dream analysis, and close attention to neurotic symptoms or slips of the tongue (also known in English as 'Freudian slips').

Freud presented a structural model of the human personality. He named the irrational part of the human personality, seeking fulfilment of primal urges, the id, which he thought was present at birth and ruled by the pleasure principle. The second component of the human personality, the ego, developed later and mediated between the id's desires and external reality. It could suspend the pleasure principle temporarily by postponing gratification. The third tier of the human personality, the superego, was the last to develop. It represented the norms and values of society as instilled in the child by parental authority through praise or punishment. The superego also instilled the drive for perfection in the child. By the time the superego had fully developed, the ego mediated between its demands, the primal urges of the id, and external reality.

Freud also developed a model of human development. According to this model, the child passed through a number of developmental stages in which particular parts of the body were the dominant erogenous zone. Newborn babies derived pleasure from the oral zone; their desires were fulfilled when breast-fed. When toilet training commenced, the child derived pleasure from the conscious control of bodily functions and the anal zone gained particular emotional significance. At the age of five, stimulation of the genital zone became a source of sensual pleasure. During this phase, according to Freud's rather speculative ideas, the child developed an attraction to the parent of the opposite sex and felt strong rivalry towards the parent of its own sex. Freud named this predicament the Oedipus complex. After the child identified with the same-sex parent, he or she entered the latency phase, which at adolescence was superseded by the genital phase. The culmination of personality development was the full development of sexual identity and the ability to form lasting relationships with members of the opposite sex. If conflicts during any of these phases were not successfully resolved, the adult personality would suffer from neuroses.

From the 1910s, Freud attracted a group of loyal followers who met regularly and, eventually, established the psychoanalytic movement. Freud's followers generated a great variety of psychoanalytic theories and psychotherapeutic treatment methods, often deviating from Freud's ideas. Alfred Adler (1870–1937), for example, emphasized the power of the ego over the unconscious. He thought that the ego compensated for feelings of inferiority by striving to realize idealistic goals in an attempt to restore personal balance. In Adler's view, relationships with other human beings were essential to the growth of the ego.

Carl Gustav Jung (1875–1961), initially Freud's close collaborator, eventually rejected his emphasis on the role of sexual desire in the origin of neuroses. Jung was interested in spirituality, which he felt could not be reduced to the need to fulfil unconscious wishes. He believed all human beings shared a collective unconscious containing memories from the history of humanity that were common to all cultures and societies. Through the analysis of the myths, rituals, symbols, and folklore from a wide variety of cultures, elements of the collective unconsciousness could be investigated. Other neo-Freudians, among them Karen Horney (1885–1952), Erich Fromm (1900–1980), Erik H. Erikson (1902–1993) and Harry Stack Sullivan (1892–1949), also emphasized the ego over the power of the unconscious and the importance of social interaction in the developing child and healthy adults. They called their

approach *ego psychology*. Anthropologists (most notably Margaret Mead and Ruth Benedict) have concluded from their fieldwork that Freud's theories have only limited applicability to other cultures.

## HUMANISTIC PSYCHOLOGY

Before the Second World War, very few psychologists practised psychotherapy. Physicians were generally opposed to laymen's involvement in psychotherapy, which they considered a medical skill. This changed after the Second World War, when the demand for psychotherapeutic services, initially by returning veterans but later by the general public, far exceeded the supply of psychiatrists. This led to psychologists being allowed to conduct psychotherapy, which, in due time, became the most visible branch of the discipline.

Initially, clinical psychologists drew upon the theory and practices of psychoanalysts and neo-Freudians. During the 1960s, however, they formulated their own unique approach to psychotherapy. Abraham H. Maslow (1908–1970) and Carl Rogers (1902–1987) defined humanistic psychology as the third force in psychology. According to them, psychologists had thus far been inspired by behaviourism, which they criticized for being too mechanistic, and by psychoanalysis, which they found pessimistic and deterministic. Humanistic psychologists emphasized the dignity and intrinsic worth of human beings and maintained that each individual contained the potential for healthy and creative growth within. In Maslow's optimistic view, human beings always strove to realize their potential. Therefore, psychotherapy's primary purpose was not to cure disease or provide diagnoses but to aid individuals in attaining a higher level of fulfilment and self-actualization. Maslow studied a number of highly successful, self-actualizing individuals in his investigation of the principles of growth and self-actualization.

Rogers' client-centred psychotherapy became very influential within clinical psychology. According to Rogers, human beings possessed an inherent tendency towards growth, differentiation, and maturation that was realized when they were involved in relationships characterized by openness, empathy, unconditional positive regard, and genuineness. Rogers' client-centred therapy supported the creation of such a relationship between therapist and client. Ideally, the therapeutic relationship was intensely personal and subjective, wherein therapists provided unconditional positive regard to their clients in order to stimulate them to explore their own feelings. Therapists encouraged clients to take charge of their own lives while refraining from offering advice, interpretations, and diagnoses. Rogers instructed therapists to listen carefully to their clients and summarize the essence of what they had heard. Therapists were to accept their clients' feelings as entirely legitimate in order to restore their self-confidence, the key to mental health and the pursuit of greater fulfilment in life.

## BEHAVIOUR AND COGNITIVE THERAPY

More recently, behaviouristic psychologists have proposed methods of psychotherapy aimed at behaviour modification. The American experimental psychologist Joseph Wolpe (1915–1997) had conducted Pavlovian conditioning experiments with cats before he became interested in psychotherapy. He pioneered behaviourist techniques to cure phobias (such as fear of heights or snakes) through a process of systematic desensitization. He argued that anxiety was aroused when an individual encountered a situation similar to one that had previously induced anxiety. This reaction could be overcome by a process of reconditioning. First, Wolpe encouraged individuals to overcome their anxieties in situations that were just mildly anxiety-provoking, then proceeded in stages to successfully manage situations that caused greater anxiety until the underlying problem had been resolved.

Inspired by developments in cognitive psychology, a number of clinical psychologists have recently developed cognitive therapy. According to Albert Ellis (b. 1913) and Aaron T. Beck (b. 1921), emotional problems were the result of faulty reasoning processes. By analysing these cognitive processes and learning alternative ones, emotional problems were alleviated. Beck has proposed cognitive approaches to anxiety and depression.

Psychologists have conducted extensive studies on the effects of psychotherapy. Eysenck reported that, on the basis of numerous studies, hardly any measurable effect had been demonstrated. He suggested that being put on a waiting list was equally effective as actually receiving psychotherapy. Only the effects of behaviour therapy appeared to be measurable to some extent. Eysenck's challenge generated an enormous amount of research on the effectiveness of psychotherapy. Lester Luborsky summarized this research by concluding that most psychotherapy is moderately effective. In addition, he concluded that different styles of psychotherapy differed only in non-significant ways. The stark divisions between different psychotherapeutic approaches did not appear to be particularly important in determining the success of psychotherapy. Currently, extensive research is being conducted on psychotherapeutic processes. These studies generally indicate that the investigation of such processes is highly complicated.

## CONCLUSION

Psychology is a fragmented discipline. There is no consensus within psychology about the characteristics of human nature, research methodology, the social function of the discipline, and the nature of its applications. Three components of the discipline have been described: experimental research, mental testing, and psychotherapy. The relationships between these three approaches have always been tenuous. Experimental psychologists purport to investigate the laws underlying human nature. Psychologists involved in the development and application of mental tests are interested in individual differences. Clinical psychologists approach their clients as unique human beings and provide help to them on an individualized basis. These different orientations and practices impede the unification of the discipline.

### Psychology in developed countries

Psychology is currently thriving in many countries around the world. Psychology in the United States has produced a

considerable amount of experimental research without direct practical applications. In many other countries, the development of the discipline has been motivated by practical concerns connected to the development of the educational system and health care facilities. As a consequence, educational psychology, mental testing, and psychotherapy are the dominant forms of psychology outside of the United States. National differences in psychology significantly decreased towards the end of the twentieth century due to an increase in international exchange among scholars. Generally, psychologists in different countries have selectively incorporated elements of experimental research, mental testing, and psychotherapy. The development of the discipline has often been spearheaded by scholars who have studied with leading psychologists, initially in Germany, the United Kingdom, and France and, currently, in the United States.[4]

Psychology has become very influential in the United States, having grown dramatically since the Second World War because of extensive military funding and the expansion of clinical psychology. Although clinical psychologists greatly outnumber experimental psychologists, the latter group has been reluctant to release its position of power and influence within the American Psychological Association. This has led to the peculiar situation where a relatively small number of experimental psychologists control the profession even though it consists mostly of practitioners engaged in psychotherapy and mental testing.

Since 1945, psychology throughout the world has been heavily dominated by developments in the United States, where an estimated 80 per cent of the world's psychologists live and work. There is a rather asymmetrical relationship between American psychologists and practitioners in the rest of the world. In teaching, American textbooks are used virtually everywhere. Psychologists all over the world read American publications while their own work, even when published in English, is mostly ignored in the United States. This state of affairs impedes progress within the discipline and makes it very difficult for American psychologists to correct cultural biases in their own work. Psychologists from several countries have applied American theories, models, and techniques uncritically and without much modification, which is inherently problematic.

The origins of experimental psychology are generally considered rooted in nineteenth-century Germany, when university life flourished. Several approaches to the field have origins in the first three decades of the twentieth century: Wundt's physiological psychology, investigations of higher mental processes (the Würzburg school), the Gestalt school, and phenomenological psychology. With the onset of National Socialism, many Jewish psychologists fled the country and continued their careers elsewhere. At this time, psychology developed its practical side, in particular its military applications. After the war American approaches strongly influenced the growth of the discipline in the Federal Republic of Germany. The German Democratic Republic aligned itself with Russian psychology, which examined the effects of social arrangements on individuals in order to aid the building of a socialist industrial society.

Psychology in the United Kingdom has always had a strong psychometric tradition and an emphasis on practical applications. In particular, the application of mental tests within the educational system was extensively developed.

After the Second World War, there were still only a very small number of academic positions in psychology. As a consequence, British psychology was characterized by its applications, mostly in the educational system, in industry, and in medicine. The same holds true for a number of Commonwealth countries, among them Canada, Australia, New Zealand, and South Africa, whose academic systems are based on the United Kingdom model.

Psychology in France was initially characterized by the pathological psychology of Janet. After the Second World War, Daniel Lagache (1903–1972), a philosopher, physician and psychoanalyst, defined and inaugurated clinical psychology in universities and contributed to the professional establishment of psychologists in medicine. Psychology in France has always leaned heavily towards psychotherapy and became strongly psychoanalytic in nature through the influence of Jacques Lacan (1901–1981). Lacan's version of psychoanalysis was built around the entrance of the growing child into the symbolic order at the moment language was acquired. Until the 1960s, there were also existentialist and phenomenological currents in French psychology. At the same time, a small experimental tradition continued to grow.

In Spain, psychology has always had a strong practical emphasis and has developed in close relation with medicine and education. Its association with the educational system led to an interest in developmental psychology, in which the theories of Piaget were particularly influential. An early prominent figure was the physician Emilio Mira y Lopez (1896–1964), who was instrumental in promoting psychoanalysis in Spain. He was also interested in the adaptation and creation of mental tests in aiding personnel selection, vocational guidance, and educational administration. Like many other influential psychologists, Mira was forced to leave Spain after the Civil War. He settled in Brazil and has exerted a strong influence on the development of the discipline in Latin America.

Psychology in Russia developed under the influence of the political organization of the Soviet Union. Under Communism, the discipline predominantly addressed educational and developmental issues and gained a strong theoretical orientation. From the early 1930s until the late 1950s, psychoanalysis, mental testing, and approaches dealing with mental phenomena were banned as 'bourgeois' in nature while Pavlov's reflexology was presented as the official Marxist doctrine. One of the most interesting attempts to reconcile a psychology of consciousness with the official doctrine of dialectical materialism was the cultural-historical school led by Lev S. Vygotsky (1896–1934), who was interested in the relationship between cultural and child development. Vygotsky's ideas were further developed by his collaborator Alexei N. Leontiev (1903–1979), who developed the theory of activity, which became the official Soviet psychological doctrine in the 1960s. Currently, Russian psychologists are redefining their identity in the post-Communist era.

In Japan, the discipline has evolved almost entirely along Euro-American lines with a strong emphasis on research. Early in the twentieth century, Wundtian experimental psychology set the tone; after 1930 Gestalt psychology predominated. In the wake of the Second World War, neo-behaviourism became influential. Psychological research has been generously funded by the Japanese government and large industrial firms. A great number of mental tests

have been imported, translated, and standardized on Japanese samples. There is currently a strong interest in artificial intelligence and cognitive psychology. Some research has been conducted in traditional Japanese psychology, especially Zen Buddhism.

## Psychology in developing countries

The development of psychology in countries outside of Europe and North America has been slow and beset by difficulties. In most developing countries, psychology was imported by the colonial powers. When these nations gained independence, their universities had to redefine their programmes. Many industrialized nations held the view that developing nations must undergo the same processes of modernization that they themselves did. They assumed that socio-economic change should be guided by an academic elite trained in Euro-American universities. Psychologists in developing countries who share this perspective have attempted to emulate Euro-American approaches, often by uncritically importing psychological theories and techniques. This has frequently caused psychology in these countries to be derivative, unoriginal, and irrelevant to national development. Often, the discipline has not evolved in response to local needs but in opposition to national and cultural traditions. In some developing countries, psychologists have recently initiated a number of research projects that address local needs and are receptive to traditional practices. This does not diminish the dilemma they face: either they conduct Euro-American style research, which is locally irrelevant, or they initiate locally relevant research and are ignored by their colleagues internationally.

Psychology in Latin America is highly developed and is characterized by educational, clinical, and industrial applications. Its development was stimulated by German and Spanish émigrés who settled there in the 1930s. In Brazil, psychology developed out of philosophy, education, and the medical sciences. Until the 1960s, it mainly followed European tendencies; thereafter, it became increasingly oriented towards North American developments. There is a strong emphasis on educational, industrial, and clinical psychology, psychoanalysis being the most influential psychotherapeutic approach. Currently there is strong interest in qualitative methods, which are better suited to address specifically Brazilian issues. Some psychologists prefer research in natural settings rather than laboratory work. Psychology in Mexico has been influenced by the approaches of James Mark Baldwin and Erich Fromm, both of whom resided there.

In India, psychology began at the turn of the twentieth century as a series of imitations and replications of research projects conducted in Germany and the United Kingdom, where most psychologists had received their training. After Indian independence in 1947, psychology rapidly expanded. Psychological research was primarily undertaken to validate mental tests for use in India and to address psychological problems related to industry, vocational guidance, education, and community service. Initially, psychologists indiscriminately imported Euro-American psychological theories, models, and tools without questioning their relevance to the Indian context. This situation changed in the 1960s, after it had been extensively criticized. In order to outgrow the alien framework, a rapid indigenization of the discipline commenced. Increasingly, scholars developed theories, concepts, and models that were relevant to the Indian context. Psychologists felt the need to orient their discipline towards addressing the myriad socio-economic stresses characteristic of a rapidly developing country. Research projects started to investigate rural life as well as the consequences of poverty. Using ethnographic approaches, child development in different cultural and religious groups has been studied. Clinical psychologists study the collective and contextual features determining personality and behaviour rather than rely on individualistic models prevalent elsewhere. An interest in indigenous modes of health care, such as Ayurveda, has led to specifically Indian conceptions of psychotherapy.

In many different countries in sub-Saharan Africa, psychology is mainly part of teacher education programmes, where the focus is on human development, learning, and educational applications. Africans have frequently been the subjects of anthropological and psychological research conducted by scholars from colonizing countries. Not surprisingly, much of this research has had limited relevance to Africans themselves. At present, serious attempts to make psychology an indigenously based discipline pertinent to national development are in progress. Unfortunately, language barriers still impede communication among African psychologists from neighbouring countries, which slows the development of a unified African perspective on the discipline.

The research conducted during the last thirty years in countries outside of North America has challenged the universality of Euro-American psychological theories. This has resulted in the development of cross-cultural psychology, which is concerned with interplay of culture, individual behaviour, and modes of experience.[5] Thus far, however, cross-cultural psychology has primarily been a Euro-American activity testing the universality of essentially Western concepts. Ideally, experts from developing countries would be considered equal partners in this research to be conducted in a spirit of dialogue aimed at mutual enrichment. Psychologists throughout the world need to be sensitive to local conditions when they appropriate Euro-American approaches. However, in addition to transforming predominant models, theories, and techniques for use within their own national context, they need to develop a psychology informed by their own nation's cultural norms and needs. On the basis of such work, exchanges can be instigated among psychologists from different countries and cultural backgrounds. These could potentially rectify the insensitivity of Western psychological theories to sociocultural factors and thereby enhance the discipline in the future.

## NOTES

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# 25

## INTELLECTUAL CULTURE

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## INTRODUCTION

*Anouar Abdel-Malek*

From the outset, the notion of *intellectual culture* gives rise to a two-part query: Is the difference between intellectual culture and the more common notion of culture simply a matter of terminology? Or is there a need to refine the substantive analysis of the field of culture towards a more specific definition of the field under study?

The term 'culture' usually designates that level of social life and activity that is distinct from the level of production of the necessities of life, traditionally based on agriculture, as in many under-developed areas around the world today. 'Culture' is commonly used to designate the level above material culture, i.e. the superstructure of social life and activities.

Culture thus understood encompasses all formative component factors and processes of superstructure: ideas and aesthetics, science and religion, philosophy and technology, power, the whole range of human or social sciences. Hence the notion of intellectual culture comprises the realm of ideas and thought, the natural and physical sciences, and the field of aesthetics (art, literature, music, etc.). However, this distinction can only be used for analytic purposes, since all component factors and processes of superstructure are simultaneously related to each other and to the whole range of economic and social structures.

The study of intellectual culture can thus be understood as the study of the *Zeitgeist* ('the spirit of the times') prevailing in the world at a given period of history. And yet, it is being used to this day to explore the spirit of the dominant Western civilization, which has become equated with the civilization of the contemporary world, as evidenced by the majority of general and specialized studies.

A word of caution is thus in order. The study of the spirit of the times can be accepted as a starting point towards the urgent task of taking stock of the whole range of civilizations, cultures and national specificities of our changing world.

In this context, any meaningful attempt to study intellectual culture in our times must take into account three major considerations:

 – The major factors – science, technology, thought processes – constitute major formative inputs of the dominant sector of advanced societies. These general factors will be considered in their dialectical interrelation with the endogenous dimension, i.e. the manifold specificities which constitute the real-concrete world of contemporary societies. This endogenous dimension is assuming a growing role in the more general sphere, at the very time of the rise of hegemonism of the central area.

 – The proper study of 'intellectual culture' in our changing world should proceed along two paths, simultaneously. Major component formative factors and processes constitute the general exogenous dimension, which can best reveal the global superstructural level. Hence, the validity of the study of the set of global factors in the thematic sections of the UNESCO project, including 'intellectual culture'. The study of this exogenous level will become meaningful if it is engaged upon simultaneously with studies of the endogenous circles undertaken in the relevant area studies of this same project.

 – In the exploration of the exogenous dimension – exemplified by 'intellectual culture', caution is required. While the exogenous circle/level deals with the more general universal dimension, it ought to be rooted in the historical and living processes at work in the different units of the endogenous circle, instead of being relegated to the area studies of the endogenous dimension. Field studies must always be given a central place. Thus, the tonality of each section of the exogenous circle/level will express its composite nature as both general 'specialism', and as output of the manifold distinct areas of our changing world.

# 25.1

# HIGH CULTURES AND DOMINATED CULTURES

*Gananath Obeyesekere*

## THE EMERGENCE OF OTHER CULTURES AND A NEW FORM OF HISTORY WRITING

One of the fascinating cultural phenomena of the early twentieth century is the advent of a unique form of writing history involving societies that have never been recorded in the official history books. The great historians of Western Europe, the Middle East, China and South Asia were interested primarily in dynastic histories and the histories of wars and conquest that lead to the self-glorification of the nation or empire. The subalterns rarely emerged as actors on the world stage, and their societies were at best only peripherally mentioned. However, in the early twentieth century, when ethnography appeared on the scene, there emerged systematic descriptions and analyses of societies and cultures never before recorded. Had we accounts of such small-scale societies for earlier periods, our knowledge of human history or culture would have been enormously enriched, and a different world view would surely have arisen. It is not that the knowledge of small-scale societies was unknown prior to the twentieth century. The colonial archives provided much admittedly biased information on the cultures dominated by colonial and imperial powers particularly after the so-called 'discovery' of the Americas and especially so after the later voyages of Captain Cook to Polynesia sponsored by the Royal Society of Great Britain. In the nineteenth century, various scientific societies devoted to the study of 'primitive' societies sprang up in the major European capitals. The strategy for studying these groups was strongly influenced by Darwinism, the period's predominant scientific paradigm, but began focusing on the evolution of a specific cultural practice or human culture as a whole. Thus, early theorists in the human sciences were interested in such things as the evolution of specific forms of marriage or kinship, and a common concern was the shift from matriarchy to patriarchy or the very opposite (both forms were perhaps antedated by primitive promiscuity, which obsessed Victorians). Another concern was the sequential evolution of religion from animatism (*mana*), animism, polytheism, and henotheism and monotheism.[1] Alternatively, it was hypothesized that human societies developed from savagery to barbarism to civilization, and these broad stages were then supplemented with early, middle or late phases, each phase heralded by a specific type of technological innovation. For example, the 'later' or third period of savagery began with the invention of the bow and arrow and led to the older period of barbarism, which in turn began with the invention of pottery and so forth. At the risk of oversimplifying, one might say that such doctrines were by and large supported by nineteenth-century thinkers like James Frazer, Edward Tylor, Herbert Spencer, Auguste Comte and Lewis Henry Morgan.[2] What made such systemic evolution possible, according to an interesting theory formulated by Adolf Bastian, was the 'psychic unity of mankind', that is, that in spite of differences, human beings were psychically the same, a much more interesting and productive notion than that of Levy-Bruhl, who postulated the idea of a primitive mentality, a sort of mystical thinking characteristic of preliterate peoples.[3]

The evolutionary paradigm and the simplistic views of small-scale societies from colonial archives, themselves mechanisms of domination (see Arjun Appadurai, Nicholas Dirks and the work of other scholars), received a severe blow as a consequence of the development of fieldwork in the United States by the German émigré Franz Boas.[4] This produced a historical anthropology of mostly Amerindian and Inuit (Eskimo) cultures (Plate 127) and an elaborate taxonomy to classify cultures, in terms of such criteria as traits, patterns and complexes, which could then be grouped into larger cultural areas.[5] Two distinguished British anthropologists, W. H. R. Rivers and C. G. Seligmann, conducted expeditions to New Guinea and Africa to undertake sustained fieldwork in two now classic 'primitive' societies, the Todas of South India and the Veddahs of Sri Lanka (Ceylon), in the first decade of the twentieth century.[6] Their students, A. R. Radcliffe-Brown and Bronislaw Malinowski, began a tradition of sustained fieldwork that in turn led to a revolution in the description and analysis of small-scale societies generally labelled as 'tribes'.[7] American cultural historians and British ethnographers and their followers throughout the world were interested in small-scale societies organized on the basis of kinship, lineage and clan organization. Kinship theory became one of the key paradigms for the study of small-scale societies, which were (it was suggested) cut from larger trans-local forms of political and social organization. Even when the emphasis later moved to the study of villages located in complex civilizations, the analytical model remained the same. By the 1960s, the scholarly world fully discovered the richness and diversity of human societies and engaged in theoretical discussions regarding the components that held each society together, namely, the idea of culture.

The attempts to understand 'culture' resulted in a multiplicity of contending definitions, but perhaps the most influential one was first formulated by Max Weber and subsequently developed by the sociologist Talcott Parsons and adapted to the field of anthropology by his heirs, especially Clifford Geertz.[8] Weber made the point that reality in the natural world is essentially meaningless; human beings impose meaning on this intrinsically formless, meaningless reality of the world, and in this way culture becomes that segment of the world 'on which human beings confer meaning and significance'. When publicly shared meanings are conferred in this manner, culture itself ends up by becoming the reality through which the world is perceived, defined and structured. It follows that if animal societies can be divided into species, human societies can be divided into cultures, and this led in turn to the more controversial thesis of cultural relativism.

The model of the 'primitive' or small-scale society contained within a frame of constructed values or culture received a severe blow with the creation of newly independent states, after the Second World War. Equally significant was the interconnecting of the world through global trade and communications, which distorted the notion of the isolated primitive. In hindsight, one wondered whether that model was supported by empirical evidence, because even the most remote societies were directly and indirectly interlocked through trade and other kinds of networks, as indeed the study of the *kula* ring (linking many New Guinea societies through trade and gift exchange) demonstrated in Melanesia by Bronislaw Malinowski.[9] Although the model of the isolated community had a sort of heuristic validity, it is also true that the 'the primitive world and its transformations' had long been ongoing. However, this process accelerated after the mid-nineteenth century.

## THE EMERGENCE OF 'HIGH CULTURE' AND ITS PROBLEMATIC NATURE

Robert Redfield was one of the pioneers that expanded the model of the small-scale society, which was deemed inadequate to deal with complex societies and 'civilizations', namely, those societies with a high degree of cultural development, a doctrinal religious corpus and a written literary tradition.[10] Here the older notion of 'culture' encompassing literary and artistic achievement met the more socially grounded Weberian notion of culture. Redfield argued that the primitive world was being transformed but also that there were multiple cultural traditions in past and contemporary civilizations in places such as India and China. Focusing on his knowledge of the cultures of India and the Americas, Redfield formulated a model for studying the small-scale society within a larger civilization (which possesses what one might call a 'high culture') by suggesting two key distinctions, the 'great tradition' of the civilization and the 'little tradition' of the village. This model was followed by his colleagues and students at the University of Chicago, who became the leading researchers in the study of 'complex societies'. Though the terms 'little and great traditions' were popularized by Redfield, similar ideas surely existed at the turn of the century at least in the work of scholars of Buddhist texts, who noted that ordinary people in Buddhist societies knew little of the doctrinal corpus or the high

culture. Consequently, they were said to be actually 'animists' or those who possessed cultural beliefs with little or no doctrinal sanction. Redfield's laudable attempt to solve this dilemma probably led to the coining of the two terms. Unfortunately, this solution, like previous ones, produced its own dilemmas. Is the little tradition of the 'ordinary folk' so different from the great tradition of the learned few, and are there not complex interconnections between the two, such that the so-called great tradition might have influenced the little and vice versa? One has only to look at the doctrinal corpus of early Buddhism to realize that it contained many popular and folk elements together with lofty philosophical speculation. Further, the idea of great and little traditions is intrinsic to the Western social science preoccupation with binary oppositions such as tradition vs. modernity, primitive vs. civilized, class vs. classless, centre vs. periphery, and many more that effectively obviate a middle ground or a blurring of distinctions. Soon fieldwork in villages of so-called civilizations and the study of doctrinal traditions themselves could no longer sustain the distinction between great and little traditions. However, this erosion of binary conceptions was not directly the result of fieldwork per se but also derived from the impact of the emerging theoretical disciplines in the global cultural scene after the 1970s and in the aftermath of the structuralism of Claude Lévi-Strauss.[11] Especially significant was the post-structuralist thought of Foucault, which examined knowledge and its relation to power, and Edward Said's *Orientalism* (developing the work of Anouar Abdel-Malek).[12] Others dealt with the important fact that some traditions are often considered ancient even though they can easily be proved to be recent.[13] Not only are traditions being constantly invented, but old traditions are being reinvented in terms of new values of modernity and post-modernity. This last issue was directly or indirectly influenced by post-modern thought that seems to radically question older ways of theorizing in the human sciences. Foucault's work in particular should make us consider whether the concepts used by early ethnographers to describe other cultures were directly or indirectly involved in the colonial domination of those same cultures. Finally, one cannot ignore the emerging new research on globalization that has focused on the possibility of a breakdown of the integrity of separate cultural forms that had preoccupied earlier scholars.

Nevertheless the idea of high culture will not simply go away, because there is the unmistakable historical phenomenon of a written, literate culture of the great civilizations of the sort historically typified by Karl Jaspers as 'axial age' civilizations, such as that of ancient China, Greece, the Near East, Iran and India.[14] These civilizations self-consciously claimed to be the heirs to a 'great tradition' or a high culture and it seems futile to deny this self-image, even though one ought to resist binary thought and not oppose high culture with a 'low culture.' Hence the title of Sherry Ortner's book, *High Religion*, which effectively deals with the recent implantation among the Sherpas of Nepal of the doctrinal traditions of Tibetan Buddhist monasticism as opposed to the popular or folk religion of the ordinary people that prevailed until now.[15] Although Ortner shuns opposing high with low, the problem of the epistemological status of both high and folk religions still remains. How high is the new 'high religion' and how removed from the 'high religion' are the traditions of ordinary Sherpas? This raises an additional question: does the high religion

dominate the already existing popular traditions? Domination is always one of degree, and while there is no doubt that the doctrinal traditions of Buddhism have transformed local beliefs, including pre-Buddhist ones, there is little evidence that domination entailed the wilful elimination of the latter by the state. The intolerance regarding local beliefs is more a function of the great monotheistic cultures, which view the pre-existing traditions as the worship of sticks, stones and idols, thereby justifying their destruction if not with impunity, at least with good conscience. In general, one could say that as far as most pre-modern states were concerned, there was little or no attempt to force the local traditions, whether tribal or village, into a mould set up by the state (regardless of the state's form). For example, in the Buddhist states of South and South-East Asia, there was little ideological control from the centre. Ordinary Buddhists were permitted to continue a multiplicity of local practices as long as they did not flagrantly violate the basic principles of Buddhist doctrine. Thus, over time most Theravāda Buddhist societies managed to abolish animal sacrifices, though such practices did continue on the local level out of reach or sight of monastic centres,[16] whereas in modern times, with the development of the nation state based on the European model, Buddhist nations have become more ideologically intolerant and have made widespread attempts to homogenize the nation in terms of the real or imagined values of the 'high' religion. This is also true of the small-scale societies or 'tribes' as recent research has shown. Indeed, throughout the world, nation states have imposed their ideologies on these societies. Thus, in his provocatively titled book *Peasants into Frenchmen*, Eugen Weber documents in great detail the manner in which local languages and traditions were threatened by the state, not necessarily through the use of direct force but rather through various means of what might be called symbolic coercion. Examples are the imposition of Parisian French as the national language to replace the various regional *patois*, and a national system of education that slowly but relentlessly reached virtually every region of the nation state.[17] In the new states of Africa and Asia, the ideological role of the nation state has been completely adopted, though the processes of domination of local regions, communities and cultures have by no means been fully achieved. In some instances, there are recent counter ideological movements that put a premium on the value of local traditions and belief systems and the benefits of cultural heterogeneity and pluralism. Once again, these ideological movements are not simply a resurrection of past traditions by political and literary elites but a function of modern social theories mentioned earlier that place value on cultural difference and diversity and the impact of these theories on public knowledge and government policies through various direct and indirect channels.

## HIGH CULTURES, ORAL TRADITIONS, AND LITERACY

One of the distinctions that some scholars believe are applicable to high religions or cultures in contrast with the 'little traditions' deals with literate vs. oral cultures. If divested of its binary oppositional features, this distinction might have some heuristic value. The major exponent of the oppositional view of the oral and literate is Jack Goody.[18] It is certainly the case, according to Paul Ricoeur, that the written text produces a kind of 'distancing' (*distanciation*) of the reader and an authoritativeness and fixity that the oral tradition lacks.[19] Ricoeur's general point is basically correct, but even this does not apply to all oral traditions as demonstrated by the Vedic texts that were memorized with remarkable accuracy and 'fixed' by Brahmin priests for over ten centuries before being recorded in writing. Further, Goody and others claim that writing and literary cultures produce more complex forms of thought than oral ones. This however can easily be disproved. Anyone will agree that the early Buddhist texts contained highly complex philosophical discourses yet it is almost certain that Buddha did not put any of it in writing, as it is not known with certainty whether writing was known or practised in his time. Further, until at least the first century BC these texts were transmitted orally. When Buddhist texts were recorded in writing, they then took on a textual fixity. Written texts also facilitated the spread of the religion to China, a literary culture par excellence. However, the distinction between oral and written is complicated by the fact that Buddhist writings operated, one might say, 'in an oral field'.

Until the development of modern printing techniques, Buddhist texts were written on palm leaves or in print in the regions under Chinese influence. Written texts facilitated memorization. In Sri Lanka, for example, monks chanted written texts, even prose ones, because through chanting one could put punctuation marks that were not conventionally found in these texts. Further, memorized texts were recited at public gatherings and in sermons. Sometimes 'textual fetishism' occurred. Thus the great Buddhist chronicle of Sri Lanka, the Mahāvamsa, was not only read but, like the Bible in medieval Europe, was treated with reverence and paraded in processions. This fact brings into question whether written texts are really 'distancing' as Ricoeur has suggested, though a certain degree of fixity is attached even to ancient texts. This was also true of Buddhist texts, known as *pāritta*, recited for the purpose of blessing people. They were carried in procession to a special place prior to being recited from memory by monks. One must also recognize that doctrinal texts produced a whole genre of edifying written literature in both Buddhism and Christianity that was modelled on their respective repertoires of folk tales. These 'intermediate texts', such as the life stories of Buddha in his previous existences, were recited at public gatherings. The texts were then appropriated by illiterate listeners who retransmitted them via the oral tradition. Additionally, like other Buddhist societies, Sri Lanka had a considerable number of literate people even in villages. We know that orally transmitted songs and ritual texts used in communal thanksgiving rituals and exorcisms were written down as early as the sixteenth century for the purpose of facilitating memorization. In more remote parts of the country, outside the orbit of Buddhist civilization, the very same texts and related ones persisted through oral transmission. Thus the field of the oral often embraced the written and the field of the written embraced the oral in complex processes of interpenetration. It was only with the advent of 'print capitalism' – i.e. the universal prevalence of printed texts in the nineteenth and twentieth centuries – that a radical separation of the two fields resulted in the partial erosion of oral expression in favour of the written word.

## NOTES

1. These writers are hardly read today. Some of the better known are J. F. McLennan, *Primitive Marriage: An Inquiry into the Origin of the Form of Capture in Marriage*, Edinburgh, 1865; R. R. Marett, *The Threshold of Religion*, London, 1909; A. C. Haddon, *Evolution in Art: As Illustrated by the Life Histories of Designs*, London, 1895; and J. Bachofen, *Das Mutterrecht: Eine Untersuchung über die Gynaikokratie der alten Welt nach ihrer religiösen und rechtlichen Natur*, 1861.

2. The reader will get a sense for the approach of cultural evolutionism in the title of Lewis Henry Morgan's book, *Ancient Society, or Researches in the Lines of Progress from Savagery through Barbarism to Civilization*, New York, 1877. Many of these ideas can be found in any good introductory text in anthropology. I suggest F. W. Voget, 'The History of Cultural Anthropology', in J. J. Honigmann (ed.), *Handbook of Social and Cultural Anthropology*. Chicago, 1973, pp. 1–88.

3. Adolf Bastian, an ethnologist, whose most significant work on primitive mentality was *Ethnische Elementargedanken in der Lehre von Menschen*, Berlin, 1895; for Lucien Levy-Bruhl read, *Primitive Mythology: The Mythic World of the Australian and Papuan Natives* (trans. Brian Elliott), St Lucia and London, 1983 [1935].

4. For criticisms of colonial classification in South Asia, see A. Appadurai, *Modernity at Large: Cultural Dimensions of Globalization*, Minneapolis, MN, 1997; and N. Dirks, *Castes of Mind: Colonialism and the Making of Modern India*, Princeton, NJ, 2001. 'Subaltern studies' was initiated by Indian scholars to draw attention to actors and events neglected by mainstream history; it was strongly influenced by Edward Said, *Orientalism*, New York, 1978. Franz Boas wrote extensively on the Northwest Coast Indians and for the general reader his work could best be understood by looking at some of the secondary literature; however an easy read would be his posthumous *Kwakiutl Ethnography*, edited by H. Cordere, Chicago, 1966.

5. For an overview of American historical ethnography, see A. L. Kroeber, *The Nature of Culture*, Chicago, 1952.

6. W. H. R. Rivers, *The Todas*, London, 1906; C. G. and Z. Seligmann, *The Veddahs*, Cambridge, 1911.

7. An easy and readable source for the development of fieldwork is G. W. Stocking (ed.), *Observers Observed: Essays on Ethnographic Fieldwork*, Madison, MI, 1985. For A. R. Radcliffe-Brown, there is once again G. W. Stocking (ed.), *Functionalism Historicized: Essays on British Social Anthropology*, Madison, 1984; for Malinowski read the convenient collection edited by M. W. Young, *The Ethnography of Malinowski*, London, 1979 and the study by R. Firth, *Man and Culture: An Evaluation of the Work of Malinowski*, London, 1960.

8. For the multitude of definitions of 'culture' see the authoritative text by A. L. Kroeber and C. Kluckhohn, *Culture: A Critical Review of Concepts and Definitions*, New York, 1963; Weber's classic definition of culture is found in '"Objectivity" in Social Science and Social Policy', in M. Weber, *The Methodology of the Social Sciences* (trans. E. A. Shils and H. A. Finch), New York, 1949, p. 81. For the modern usage see the seminal essays by C. Geertz, *The Interpretation of Cultures*, New York, 1973.

9. For Malinowski see note 7.

10. Robert Redfield's seminal work is very readable. See *The Primitive World and Its Transformations*, Ithaca, 1953; and *The Little Community*, Chicago, 1955. For the early application of these ideas to India read, M. Marriott (ed.), *Village India: Studies in the Little Community*, Chicago, 1960.

11. Claude Lévi-Strauss is not easy to understand but, as with Foucault, there are good popular expositions of his work. The general reader however ought to read his *The Savage Mind*, Chicago, 1966. My suggestion for the inquisitive non-specialist reader is H. H. Penner, *Teaching Lévi-Strauss*, Atlanta, GA, 1998

12. Michel Foucault is a must for all interested in contemporary thought though his extensive corpus is perhaps somewhat forbidding. However, everyone ought to read at least *The Archaeology of Knowledge* (trans. A. M. Sheridan Smith), New York, 1972; and *The Birth of the Clinic* (trans. A. M. Sheridan Smith), New York, 1973. For Edward Said, see note 4; and see Anouar Abdel-Malek, 'Orientalism in Crisis', in *Diogenes*, Vol. 44, (winter) 1963.

13. E. Hobsbawm and T. Ranger (eds), *The Invention of Tradition*, New York, 1983.

14. K. Jaspers, *Vom Ursprung und Ziel der Geschichte*, Zurich, Artemiss-Verlag, 1949; and the development of his thought by S. Eisenstadt, 'The Axial Age: The Emergence of Transcendental Visions and the Rise of Clerics', *European Journal of Sociology*, Vol. 23, 1982, pp. 294–314.

15. S. B. Ortner, *High Religion: A Cultural and Political History of Sherpa Buddhism*, Princeton, NJ, 1989.

16. For details read, G. Obeyesekere, *Imagining Karma: Ethical Transformation in Amerindian, Buddhist and Greek Rebirth*, Berkeley and London, 2002.

17. E. Weber, *Peasants into Frenchmen: The Modernization of Rural France, 1870–1914*, Stanford, CA, 1976.

18. For convenience one could read J. Goody (ed.), *Literacy in Traditional Societies*, Cambridge, 1968; for a critique of Goody and for the significance of oral traditions for history read J. Vansina, *Oral Tradition as History*, Madison, WI, 1975.

19. Read especially P. Ricoeur, 'The Hermeneutical Function of Distanciation', in: *Hermeneutics and the Human Sciences*, (J. B. Thompson, ed.), Cambridge, 1981, pp. 131–44; and his essay in the same volume, 'The Model of the Text: Meaningful Action Considered as a Text', pp. 197–221.

# 25.2

## SOCIAL CONDITIONING AND THE IDEOLOGICAL TREND IN THE HISTORICAL-CULTURAL PROCESS

### Geoffrey Hawthorn

### THE INHERITANCE

In 1914, the prevailing self-consciously progressive ideologies were nationalism, liberalism and socialism. Nationalism – the conviction that peoples, defined by a common history, a common homeland, or a common culture (and in certain cases, all three) should be free to govern themselves – constituted a challenge to foreign rule. Liberalism, the conviction that individuals were bearers of common civil and political rights, challenged the precepts and practices of absolutism and, according to some, imperialism as well. Socialism, the conviction that all were entitled to live in what was previously called a 'commonwealth', presented a challenge to the first two ideologies. Nationalism, the socialists argued, would undermine the cosmopolitan promise of the eighteenth century, while liberalism would subvert the promise of equality.

Nationalists often referred to 'authenticity' in the language, customs and courage of ordinary people, especially those drawn into what eighteenth-century commentators had described as the new 'commercial society'. Nationalists celebrated this notion in idealized histories and romantic art. The liberals stressed the freedom of individual judgement, which, they believed flourished best in a commercial society. This line of thinking was celebrated in histories of the triumph of freedom over oppression, and in realistic artistic expressions. Socialists emphasized the need to overcome the material constraints and social divisions of commercial society. They embraced histories cast either in an evolutionary mode or a dramatically revolutionary manner. Their art also was realistic but directed more at ordinary people.

Some nationalists were liberal, others conservative. Some liberals foresaw evolving towards socialism, and many socialists shared the liberals' emphasis on economic change. During the First World War, however, and in the war's aftermath, these convictions intermingled in new ways. The collapse of the second Socialist International at the outbreak of the war and the failure of the Russian Bolsheviks, at the end of the conflict, to spread the revolution across Europe to prompt the liberation of what Lenin called the colonized 'peoples of the East' from their imperial masters, led socialists to postpone their internationalist ambitions and concentrate on the project of 'socialism in one country'. In

this effort, they found themselves united with the once-despised nationalists. Liberals in Europe were dismayed by the war, by the Bolshevik revolution in Russia, and by the resultant fragility of their economies. Adherents of all three ideologies were forced to reconsider their positions.

Those active in the new movements for independence from colonial rule in Asia and Africa, however, were encouraged by the collapse of the Austro-Hungarian and Ottoman empires, by the subsequent realization of nationalist ambitions in Central and Eastern Europe, and by the United States' refusal to allow the victorious imperial powers to re-colonize German and Ottoman territories in Africa and the Arab lands. In India and South-East Asia, as in China after the end of imperial rule in 1911, they adopted positions that were both nationalist and socialist. In the Arab lands, Islam was beginning to shape a specific identity and provide a moral and constitutional charter for a less locally defined brand of nationalism. Only in Latin America were intellectuals unaffected by the upheavals of the war, and even in Mexico, whose long revolution was influenced by ideas of agrarian socialism, debate continued on the familiar nineteenth-century ideological arguments and notably concerning the virtues of 'ancient' vs. 'modern' liberty.

### THE YEARS 1918–1939

The changes were initially most manifest in Europe. This occurred for four reasons. It was in Europe that the most far-reaching social transformations had been taking place, the most painful of which was the transformation of millions of peasants into industrial workers. It was in Europe that people had suffered most directly from the war. It was at Europe's doorstep that the Bolsheviks had launched their revolution. And it was in Europe (as well as in North America) that via print, radio, television and the development of other information technologies, there arose a popular culture that would spread to every corner of the world by century's end.

In politics, the old conservative ideologies, predicated on a settled agrarian order, began to fade. National liberals were now fighting alongside national socialists (and in the south, with the Roman Catholic Church) for the allegiance and

control of the new urban working classes. In those countries in which the transition to industrialization had been particularly brutal and the wounds of war most severe, there emerged what the Italians called 'fascist' alliances against both liberals and the perceived threat of communism. In the realm of culture, the more adventurous writers, painters and composers turned away from romanticism and realism to capture the movement and disruption of social and technical changes in self-consciously 'modernist' forms of aesthetic construction. In social and political thought, it became more difficult to see a continuity between the present and the past, and except among the Marxists and a few diehard liberals, historical understanding gave way to a 'logical positivism' or unhistorical 'phenomenologies' in philosophy, to historical social sciences, and to a renewed enthusiasm for the achievements and methods of the natural sciences.

But these changes were not limited to Europe. In the United States, where there was no strongly rooted conservative tradition and European-style socialism had little appeal, politics remained liberal. But the culture in America was enthusiastically democratic. The new mass culture – fuelled by extensive literacy, a lively popular music scene invigorated by the migration of black workers from the South to the cities of the East and the Midwest, and the rapid development of radio and the commercial cinema – was sweeping the country. In American universities, which were more open than those in Europe and accordingly more responsive to social changes, the natural and social sciences expanded even more rapidly. And the government's economic intervention in the 1930s, which also fostered the mobilization of writers and artists for the purposes of documenting American society, increased the nation's awareness of the lives of ordinary people. In Latin America, where the governments of the larger countries promoted an industrial economy, to combat the threat to their agrarian exports posed by the Depression, there was renewed enthusiasm for the new politics and culture of Europe, particularly among the educated middle classes who embraced European tastes. In Japan, where the urban population was expanding and the government had embarked upon a programme of forced industrialization at the end of the nineteenth century, increased literacy and the new technologies were creating a popular culture that drew on increasingly stylized images from Japan's past.

By contrast, in colonial societies, industrialization and its concomitant urbanization (except in Japanese-occupied Korea) progressed less rapidly, literacy was very restricted, indigenous communities were not encouraged to celebrate their own past, and rule remained firmly in the hands of the imperial power. Only in the Arab countries did more than a few Westernized intellectuals venture into a completely redefined form of modernity.

## FROM 1945–1991

Wars cause societies to reconsider their past, often to break with it, and to create new possibilities and practices for the future. The First World War had taken place principally in Europe. It gave nationalists new hope, made liberals pause, and gave some confidence to socialists. Because it mobilized large numbers of workers, it also accelerated the cultural consequences of social and technological change. With the exception of the Arab world, however, its impact was felt largely in Europe itself and in the United States. The scope of the Second World War, by contrast, extended around the world. The war had involved virtually all nations except those in Latin America, and its impact, even on the Arab societies, was correspondingly great. But it also served to divide the world. The defeat of Germany, Italy and Japan by the Allies led to the subsequent 'Cold War', characterized by political and cultural antagonism on an unprecedented scale. The previously colonial territories were also becoming sovereign states and connected to the divided new world, not least through a United Nations Organization that was more extensive and more ambitious and enduring than its precursor, the League of Nations. But even as the new nation states were drawn into this new world order, their material disadvantages gave rise to a division of a different kind.

The relations between ideology and culture thus changed again. In the industrial economies of the Americas, across Central and Eastern Europe and Soviet Asia, in Australasia and East Asia, culture became more divorced from politics. Most of the liberal democracies in the American sphere of influence had opted for some type of social democracy, guided by precepts of a more moderate liberalism and socialism. This trend was accompanied by a discernibly new detachment (except on the part of deliberately political intellectuals) in their literature, visual arts and music. The adventurous, and sometimes aggressive modernism of the interwar years was softened in the new political context.

This was not the case in the new Third World of post-colonial states. Having been freed from one set of constraints, many intellectuals in these countries found themselves faced by another. The world into which they had come was defined by the United States and the Soviet Union. The influence of each, however, was different. In its ideological liberalism, economic power, and popular culture, the United States was seen by many to be the continuation of European imperialism under another flag. In its ideological socialism, its apparently proven capacity to resist the power of international capital, and its open opposition to the United States, the Soviet Union seemed to offer an alternative.

Therefore, it was not surprising that in their desire to assert their new independence and to offer a vision for a future that they could at last call their own, many Third World politicians and intellectuals, like those in many parts of post-war Europe, combined nationalist enthusiasm with socialist conviction. These newer post-colonial societies, however, were more diverse than those in Europe, and they embarked upon independence with a variety of metropolitan influences. Their ideologies were correspondingly different. In the formerly British territories in Africa and South Asia, the dominant voices had received a legal and political education in Britain itself, and argued their case in the idiom of reformist socialism. In the formerly French territories of Africa, whose dominant voices had received a more broadly humanist education in France and been affected by the enthusiasm there for the music and dance of black America, the idiom – as in the defence of *negritude* – was more literary. The former French territories of South-East Asia, the former Spanish and Portuguese territories in Africa that achieved independence somewhat later, and the former Dutch territory of Indonesia, were influenced by the European communist parties' sympathy with the anti-colonial cause. In the larger countries of Latin America, where independence from Spain and Portugal had been

achieved at the beginning of the nineteenth century, where there was less anxiety to construct a new political and cultural identity, where European forms of socialism had not taken root, but where the influence of American popular culture was more pervasive, intellectuals concentrated on lamenting what they described as the continent's increasing cultural and economic 'dependence' on the United States. Only in the smaller countries of Central America, where a nationalist revolution in Cuba in 1959 attracted the interest and support of the Soviet Union, was this anger at dependence expressed in a more openly socialist manner.

The situation was different in East-Asian societies and the Arab world. Notwithstanding their commitment to the principles of Marxist-Leninism, the governments of the People's Republics of China and North Korea distanced themselves from the Soviet Union and promoted a syncretism of socialist principles and precepts drawn from Confucian tradition. In those Asian states politically aligned with the West – Japan, South Korea, Taiwan, the Philippines, Malaysia, Singapore and Indonesia – the governments were hostile to communism and did not resist the spread of American popular culture. In all the states of East Asia, whatever their political inclination, the intellectual community was marginalized. In the Arab world, by contrast, Islam, which had conferred a new pan-nationalist identity after the end of Ottoman rule in 1919 and provided a foundation for law, produced a closer connection between the state, the intellectuals and the people. The adherence to traditional Islamic principles also kept the secular liberalism and socialism of the West at a distance and gave rise to a remarkably powerful, pervasive and coherent culture.

## AFTER 1945

Between the two world wars and during the Cold War, intellectuals everywhere had assumed that there was a political and cultural choice between the past and the present. With the demise of the Soviet Union in 1991, however, one of the two great political choices of the beginning of the century – the choice between a conservative and perhaps liberal past and a liberal or socialist future – seemed to have been pre-empted. The truly conservative regimes had almost everywhere disappeared. Now socialism, it appeared, had no future either. What remained was a liberal international economy, an enthusiasm (at least in principle) for democracy and nationalism. In the West, the moment of the Soviet Union's collapse was even proclaimed as the 'end of history'. The alternatives to liberalism had been tried and been found wanting. Democracy satisfies peoples' desire for recognition, and science met their material needs. Although this might be an exaggeration, considerable changes were nonetheless underway. Transformations of a technical as well as a political nature had freed international financial markets, and the United States had taken the lead in urging a greater freedom of international trade. Other governments could only protect their currencies by reducing inflation and its alleged causes, which included their own expenditures, and had increasingly less control over their economies. Across Latin America and Africa and in parts of Asia, the difficulty had been compounded by accumulation of debt. The post-colonial project of constructing and defending a national economy was greatly weakened. Those who had looked forward to one or another kind of 'socialism

in one country' could no longer convincingly do so. Internationally, and in the new enthusiasm for liberal democracy, domestically also, there seemed to be only one possible course.

However, in cultural matters the collapse of what had been seen, outside Russia, as Moscow's foreign rule, and the effects of the new international economy and its information technology on even the most established nation states, released new vigour. In parts of south-east Europe and western Asia, old nationalisms reappeared and several previously dormant ones began to surface. In the more established nation states, there was renewed enthusiasm for cultural difference.

In insisting on newness, the 'modernism' of the early twentieth century had remained connected to the past. The movement that came to be known as 'post-modernism' by the 1980s broke that connection. Post-modern intellectuals rejected the 'grand narratives' of progress that had inspired and guided their predecessors. The self-examination of the late twentieth century, they argued, had to be different. In high culture (philosophy, literature, music, and the visual arts) and popular culture (styles of food and dress and leisure) the old and the new now co-existed in a kaleidoscope with no meaning beyond itself, indeed with no single meaning. Post-modernism as a doctrine was a product of the North and West, i.e. of the intellectual culture of the United States and Western Europe. As a mood, however, it also affected the societies of the South and East. At the beginning of the twentieth century, these societies had been largely rural. By century's end, they were fast becoming urban. The cities of Latin America, Africa, and Asia – parts of which were as prosperous as anywhere in the cities of the North, parts of which were also collections of urban villages, and poor – were now also kaleidoscopes of styles. This new metropolitan culture was fast becoming truly 'global' and 'multi-cultural'.

## CONCLUSION

In 1914, the concepts of the cultural and political future were those formed in the self-examination of Western Europe and the United States. To self-consciously progressive Europeans and Americans, despite the obvious tensions and even contradictions between them, the beliefs on which these concepts rested were self-evident. To those, elsewhere in the world, who were aware of them, they could seem self-evident also. These people, who had been considered backward by Europe, were often inclined to accept European criteria of advancement. By the 1990s, this situation had changed. Even though this fact was temporarily overshadowed by the West's triumph at the end of the Cold War, and despite the more enduring victory Western liberalism appeared to have secured, political and cultural intellectuals in the North were losing confidence in what had once been considered the inevitable and universal consequences of their own intellectual development. A new type of history was in the making in East Asia and an alternative history guided the Islamic world. Despite the spread of a new and truly global popular culture, nowhere in the South did the future correspond to any of the ideals imagined by the North. At the end of a century that had been driven by war, there appeared to be no winner in matters of thought and feeling.

# 25.3

## THE EFFECTS OF SCIENCE AND TECHNOLOGY ON INTELLECTUAL CULTURE AND ART

*Oumar Dioume*

To investigate the impact of science and technology on the activities of the mind, we need to consider how they are influenced by philosophy, culture and ethics in their turn. Our intention here is to shed light on the imprint left by science and technology on the development and the state of culture and the arts in the twentieth century. Science and technology affect our everyday lives and weigh on our future. In contrast to nature, culture (and art in particular) includes everything that is the work of human beings. It is therefore legitimate to reflect on the paradigm of the interaction of culture, cultures and progress in the realms of science and technology.

To varying degrees, scientific and technological progress has penetrated every corner of the world, irrespective of the level of development. This progress has resulted in a great diversity of effects, quantitative and qualitative, negative or positive, depending on the criteria adopted in our everyday lives. The economic and financial impact is not always compatible with the cultural consequences when it comes to ensuring the preservation and survival of the diversity of cultures – diversity being the necessary counterweight to the process of uniformization engendered by globalization, an irresistible movement of waves of prodigious power sweeping through every sector of activity and thinking in every country. Humanity today enjoys extraordinary access to other cultures, made possible by the phenomenal developments in air transport (tourism and organized travel), telecommunications, television and all the new information and communication technologies (ICTs).

Despite this priceless treasure of ready access to other cultures, we should bear in mind these words of Claude Lévi-Strauss:

> Every culture represents an asset of considerable human richness. Every people has an asset of beliefs and institutions which represents experience that is irreplaceable in the whole of humanity. When humanity feels threatened by standardization and monotony, it becomes aware once again of the importance of differential values. We would have to completely give up the idea of seeking to understand what it means to be human if we did not recognize that hundreds, or indeed thousands, of peoples have invented original and different ways of being human. Each brings us an experience of the human condition different from our own. If we do not try to understand it, we cannot understand ourselves.

Lévi-Strauss's observations represent an updated version in the age of ICTs of the words of the ancient Roman poet Terence: 'I am a human being, I count nothing human foreign to me' ('Homo sum, nihil humanum a me alienum puto').

It is therefore natural to grant analytical priority (but not primacy) to the effects of the newest, most recent sciences and knowledge-based technologies. These current technologies influence and enhance efficiency of the traditional sciences and technologies of the first half of the twentieth century. The prodigious development of the cultural industries serves to illustrate this point.

Today, the globalization of the means of communication enables us to exchange knowledge, technology and values at the speed of light. The exchanges generated by the cultural industries harbour both a potential for fruitful intercultural dialogue and a multicultural mercantilism that facilitates an intermingling of cultures, previously unknown to one another.

Cultural industries cover sectors of activity in which the creation, production and exchange of goods and services interact. Their specificity is defined by the intangibility of their culturally defined content, which is usually protected (especially in the countries of the North) by copyright law. To be more precise, cultural industries include crafts, design, print publishing, multimedia and film, audiovisual and phonographic production, in addition to the visual arts, architecture, the performing arts (music, dance, theatre, etc.), the production of musical instruments, sports, advertising and cultural tourism. With such a wide range of activities, it is possible to include under the umbrella of cultural industries virtually all activities practised by existing societies however disparate their levels of economic development. Cultural industries promote the raw material of creativity, which is in turn stimulated by imagination. Einstein used to say that 'imagination is more important than knowledge'.

One decisive impact of the cultural industries on every society in the twentieth century is their capacity to increase the economic value of intellectual work, which in turn generates new values, for both individuals and societies. The case of the United States offers a significant illustration of this assertion. The emergence of a 'brown' culture from the spread of hip-hop music, derived from the rap music of the black ghettos, to various categories of American youth is currently shifting interracial relations towards a more shared culture for future generations.

The main characteristic trait of cultural industries is their dual nature: cultural and economic. Cultural industries contribute to the preservation and promotion of cultural diversity while expanding public access to culture, but they also create employment, wealth and innovation in terms of production and distribution. An interesting illustration of this phenomenon is the market for electronic games, which expanded astronomically over the last decade of the twentieth century. The result was an exponential growth in job creation in the developed countries. That growth was also the catalyst of the famous trade dispute over the issue of the 'cultural exception', an issue involving not only hundreds of millions of dollars but also the sociocultural impact of the globalization of all sorts of exchanges.

The notion of the 'global village' elaborated by Canadian sociologist Marshall McLuhan implicitly encapsulates the intermingling of cultural industries and the new ICTs. These technologies raise the question of the interrelatedness of culture, technical skills, technology and philosophy, and the pervasiveness of technical skills and technologies in our everyday experience. This ubiquitousness and omnipotence forces us to question the relevance of devising new concepts to describe the increasingly present and obtrusive effects of the so-called 'philosophy of technology'.

Such questions also pertain to the relationship between technology and culture. Technology is acknowledged to be one of the most important factors of evolution in the history of humanity. The twentieth century illustrates this more clearly than ever before. Given the century's unprecedented scientific and technological progress, it seems therefore crucial to examine the links between technical skills and philosophy and between technology and culture. Such an investigation raises questions more vast than the effects of the products themselves.

In everyday life, we are immersed in a culture steeped in technology, which is omnipresent and powerfully affects our lives. The challenge then can be stated in the following terms: what are the intangible effects of information technology (IT)? Today, IT influences every aspect of the processes of wealth creation, knowledge and information exchange, health-care innovation, distance learning, and overcoming the technological gap between developed and developing countries. By using the springboard of innovation, developing countries are able to make similar technological leaps as those made by the countries of the North, more quickly and at lower cost. Two examples worth mentioning are Bangalore, India's Silicon Valley, and the impressive advance of teledensity in many poor countries. Concerning these 'successes', we must measure the impact of computer-dependent technologies.

Even those not versed in information technologies are affected by the omnipresence of the computer as a tool with huge information processing power and unimagined capacities to perform multiple tasks. The transmission and processing of information, major components of culture and vectors of a new culture are subject to permanent upheavals and innovation. Computers and the other technical information tools have dramatically altered the various types of interactions between the human race and its environment. In numerous fields, such as biotechnology, telemedicine, distance teaching, robotics, electronic commerce, artificial intelligence, wireless interpersonal communications and numerous types of exchanges dependent on electronics and IT, it is more the cost of progress that determines the value of our consumption than the actual cost of the goods exchanged. Such is the face of the new economy, which emerged in the twentieth century, developed in the second half, and accelerated at even greater speed in its last decade. This economy is based on the production, distribution and consumption of intangible goods, knowledge, know-how and information.

The most characteristic impact of this revolution may be described as the:

> re-appropriation of the knowledge of which industrialization has robbed us ... After many centuries of divorce between highly specialized techniques and non-specialized culture, the technopole now mediates between what some know and what others do. There is thus a return to the technical culture that has marked each stage of human development ... In this attempt at re-appropriation, we are benefiting from a second-degree technology whose goal is to make access more and more simple to technologies that are more and more complex. These are enabling technologies. They give us back knowledge, but they also re-establish contact with other people. These are the interceding technologies. Overcoming space, telecommunications enable us to talk to anyone on earth. Overcoming time, recordings (audio and visual) provide us with a living memory of humanity in the past and the future.[1]

We should also note the obverse of the benefit gained from these technologies 'whose goal is to make access more and more simple to technologies that are more and more complex'. Referring to the atomic bomb, Albert Einstein said: 'The release of atom power has changed everything except our way of thinking ... the solution to this problem lies in the heart of mankind. If only I had known, I should have become a watchmaker.' Beyond the moral impact of the confusion between real and virtual killings and the subliminal incitement to violence peddled by many electronic games among adolescents and adults, there is another problem that has to do with the perverse effects of these 'enabling technologies': what is the role of play within a culture that promotes the spirit of technological creation?

We need then to ask, in a more general context, about the impact of the growing grip of technology on philosophy. This grip is a permanent reality manifested by such extreme cases as the debate on human cloning, human reproduction through artificial insemination, euthanasia, and the creation of databases containing information on individuals that limit their freedom. All these discoveries and achievements are occurring in a context of the headlong development of genetic, protein and molecular engineering, and increasingly sophisticated computer systems and equipment.

Because of the multiple ethical and moral consequences of these technologies, there are good reasons for engaging in

a debate on the future of humankind. Culture's dependence on technology threatens to become even greater in the future when we think of the advantages of the continual development of 'enabling technologies'. Considered together, technology, science and engineering constitute an instrument for constructing the future and especially the future of society and consciousness. More then ever, technology today plays an existential role and is an integral part of general future trends. Today, the philosophical character of technology becomes clearer with the growing interconnection between technology and information sciences and biology.

Such a paradigm naturally raises questions about the ultimate purpose of the survival and preservation of those cultures currently most at risk, which are natural in the context of a debate on the relationship between philosophy and technology. But, in that case, is it relevant and meaningful to refer to the notion of philosophy of technology? If technology is understood as a science of the most efficient possible concretization of the means required to perform the functions necessary to society, it should be recalled that the evolution of technology is a socio-historical process, which cannot be apprehended separately from the sociocultural reality and philosophy of the given environment. Even so formulated, it is not obvious that this vision of technology facilitates the emergence of a consensus as to the meaning to be ascribed to the concept of philosophy of technology.

Nor should we lose sight of the fact that the relationship between technology and philosophy was long seen through the prism of classical technology based on mechanics, even after the emergence and diffusion of information technologies. Such an approach, which neglects information technologies and their impact on technology in general, is certainly inappropriate today. That impact is determinant in the creation of our current world view.

We are thus led to inquire still further into the ultimate aims of technology. The debates between environmentalists and advocates of energy self-sufficiency – a form of economic development that intensively exploits natural resources even at the risk of threatening the survival of the planet – are fundamental debates about our society, way of life and general philosophy. The impact of such choices is not only economic and cultural but also political since certain influential countries in the North are now governed by majorities in which the Greens have a decisive voice.

The existential questions about the survival of the human species result directly from the possible consequences of humanity's technological activity. Any number of perverse effects such as a nuclear or ecological disaster might annihilate humankind. On the other hand, preventive strategies to preserve the human species will also be based to a large extent on technological underpinnings. A major impact in our paradigm is the spread in all present-day societies, naturally to varying degrees, of the debate on the finality of technology and of the concrete implications of that debate.

To assess the impact of ICTs on culture requires a capacity to apprehend the intrinsic issues and challenges of that culture in all their complexity. Thus culture would be in the position of both judge and defendant. The first challenge to grasp is inherent in the profound differences between ICTs and the communication networks. The former transcend borders, in contrast to traditional networks designed for national or regional use. Through images and sound, all information regardless of its relevance can be transmitted virtually instantaneously to any community, however remote geographically, provided that is connected to an adequate ICT network. Although still incomplete, the web into which ICTs have woven all countries is perhaps the most complete reflection of the globalization of intangible exchanges which has critically restructured entire sectors of the world economy.

This restructuring reflects a deregulation, which, from telecommunications to the audiovisual media, is in the process of shaping and altering the relationships between the state, corporations and individuals.

The Internet was born of the encounter between the computer and telecommunications. Only a minority of countries, hence only a small portion of the world's population, has reliable access to a computer in case of need. Is the Internet a factor tending to deepen the gap between rich and poor countries? With the capacity to transport a vast quantity of information in real time, the Internet is a decisive factor in the expansion of the exchange of goods and information worldwide. The facilities for downloading files, sending emails and conducting e-business are concrete manifestations with decisive economic and cultural consequences for the future.

Never in the history of humanity has information been exchanged so quickly and over such a vast area. The Internet has also transformed the means of access to culture. José Saramago, the winner of the 1998 Nobel Prize in Literature, has written: 'Information makes us wiser and more knowledgeable only if it brings us closer to our fellow humans. Now that we have long-distance access to all the documents we need, we run an increasing risk of dehumanization, and of ignorance. Nowadays, the key to culture lies not in experience and knowledge, but in your aptitude at hunting down information on the Net. You can be entirely ignorant of the world – the real social, economic, and political world you live in – yet accumulate every possible kind of information. Communication is ceasing to be a form of communion. We are sadly seeing the ending of real person-to-person communication.'[2] Thus one striking impact of the Internet is to deprive communication of its character as a friendly interpersonal exchange of information.

According to Marc Augé, 'new techniques of communication and image-making render the relation to the Other more and more abstract; we become accustomed to seeing everything but there is some doubt whether we are still looking. The substitution of media for mediations thus contains within it the possibility of violence.'[3] If that is so, then what will become of art in light of these challenges from new technologies, nowadays affecting virtually all human activities?

A correlation between art and technology becomes apparent through the needs of artistic research. Artistic expression also reflects the scientific and technological achievements of its time. It is obvious that it is no coincidence that the impressionists and their works appeared at the end of the nineteenth century rather than in Rembrandt's time. Technology has long been one of the most important and most durable factors influencing art. One has only to observe the prominence of the visual and audiovisual arts in the new realms of creation and communication opened up by the new technologies of the twentieth century.

The demands of art and the modus operandi of artists have always stimulated scientific research and technological innovation, and the arts feed education, leisure and the cultural industries with vast economic potential. The confrontation between demand and creative capacity, on the one hand, and analytical and technical power, on the other, offers considerable potential for innovation. Examples from the field of music illustrate the extent to which science and technology can seek their inspiration in the arts. The most recent example is the compact disc, the result of the extraordinary applications of IT and electronics in the music industry.

This is one stage in the fantastic leap from the pre-electronic age to the computer-generated music of our times. Indeed, computer-synthesized sound, a collaborative effort by scientists and musicians, has altered our conception of musical sound. The development of microelectronics is making digital techniques more accessible. Synthesizers, mostly digital, are specialized computers dependent on software that is the fruit of know-how brought about by hands-on experience and research.

In some case, only those musicians who are comfortable with IT have been able to fulfil the technical requirements of music, as in the case of computer-assisted musical notation. This problem was solved by the composer and instrumentalist Leland Smith, by developing a specialized computer language. In the field of robotics, US developers have collaborated with choreographers to give more grace to robots designed to assist the disabled.

The progress and achievements of artistic works whose sources of inspiration lie in science and technology are today virtually taken for granted. Yet we should do well to remember the importance of these processes in the development of the arts. In the field of painting and sculpture, the computer has become a tool of creation through computer graphics and digital photography. We should also note the role of the physical sciences (lithography and electroplating). For architects, digital programmes are replacing manual drawings. Even in the field of dance, the computer is proving to be a powerful tool for stage technology. As for the theatre, the development of stage lighting has allowed the development of sophisticated staging techniques. Cinema technology, with its spectacular special effects, exerts such an influence that nowadays we no longer look at a film or a play in the same way.

An economics of culture thus came into being as a result of the effects of science and technology on culture and art in the twentieth century. Moreover, this intermingling engendered an economic and technological culture based on the fetishism of efficiency for its own sake. Rich in extraordinary potential for cultural and artistic creativity, this intermingling can also entail, if we are not careful, the risk of accelerating the process of uniformization of cultures, whose diversity should always remain one of the treasures of humanity. To preserve this balance of cultures requires an ethical vision of the impact of the sophisticated tools that we use to develop the intellectual culture and art of our times.

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# 25.4

## CULTURE AND MASS PRODUCTION
### CULTURAL INDUSTRIES

*Elizabeth K. Jackson* and *Alemseghed Kebede*

As noted by Karl Marx, ever since capitalism surfaced as a viable socio-economic system, it has never ceased to revolutionize the instruments of production. Despite his interest in post-capitalist society, Marx acknowledged that capitalism is a highly dynamic and productive social system: 'The bourgeoisie, during its rule of scarcely one hundred years, has created more massive and more colossal productive forces than have all preceding generations together'.[1] However, the development of capitalism has taken place in unprecedented fashion well beyond the predictions of the author of *Das Kapital*. Capitalism has endured despite the expectation of its imminent demise. The capitalist system has not fettered the development of the productive forces as envisioned by Marx. Rather, tremendous advances in technology have taken place. By and large, as a reaction to new developments, capitalism has readjusted itself, giving rise to manifold alterations within the framework of the capitalist system. And this readjustment has taken place without radically challenging the fundamental attributes of the system.

### FORDISM

Perhaps one of the most salient features of capitalism during the early twentieth century has been the development of Fordism.[2] Fordism was a mode of economic and social regulation that led to a series of interrelated outcomes. The semi-automatic assembly line technique, introduced by Henry Ford and based on unskilled collective labour in which each worker carries out a strictly defined task, led to mass production (Plate 128). But this development must be accompanied by mass consumption, since the former would be meaningless without the latter. In order to further maintain the production-consumption continuum, two conditions must be fulfilled. In the first place, workers had to change certain aspects of their behaviour in accordance with the emergent productive processes. Every aspect of the worker's life had to be rationalized so as not to impede the dynamism of a cohesive course of action. Secondly, workers had to consume given a certain level of income. To the extent that the market was expanding and the rhythm

of capital accumulation intensified, via higher wages, the purchasing capacity of the worker had to be augmented. Furthermore, in order for this process to be facilitated, the role of the state had to be recast. Accordingly, the state became the 'interventionist state' whose responsibility, among other things, was to facilitate effective demand among the populace. This was made possible by the introduction of minimum wage and social security benefits.

### THE CULTURE INDUSTRY

Fordism was not limited to the economic sphere, for it extended to the realm of culture as well. Theodor Adorno and Max Horkheimer have described this process in their concept of the *culture industry*,[3] referring to an industry-culture formation in which everything social yields to the logic of capital. Consequently, products lose their intrinsic worth; they become significant only when they are exchangeable. Under a state in which the culture industry reigns supreme, the goals considered worth pursuing by the powerful are sought by available means, without considering the ethical repercussions of the latter. Even art, with its claims to the highest form of self-determination, falls prey to this process.

Debunking the idea that the arts were somehow pristine, original and independent of forces that would dictate both the nature and quantity of cultural material, Adorno and Horkheimer argued instead that the so-called 'traditional' arts have been pushed aside by a mass, industrialized and capitalist profit-making machine. While appearing to offer unique artistic or cultural representations, culture industries instead produce items characterized by uniformity, predictability, and assembly-line sameness designed to sell the maximum number of cultural units (goods) to the consumer. 'What is new is not that it [art] is a commodity, but that today it deliberately admits it is one; that art renounces its own autonomy and proudly takes its place among consumption goods constitutes the charm of novelty.'[4] In this context, the dictum that the purpose of art is purposelessness, that it is valuable unto itself, loses its

meaning. The market has declared its definitive triumph over the realm of purposelessness.

Two features, namely, standardization and pseudo-individuality, specifically characterize the culture industry.[5] Standardization refers to cultural production being carried out in accordance with rigidly defined sets of principles. Adorno and Horkheimer imply that standardization eradicates the impromptu and unpremeditated, proliferating sameness:

> How formalized the procedure is can be seen when the mechanically differentiated products prove to be all alike in the end. That the difference between the Chrysler range and General Motors products is basically illusory strikes every child with a keen interest in varieties. What connoisseurs discuss as good or bad points serve only to perpetuate the semblance of competition.[6]

Consequently, the implication is that culture is disentangled from its critical feature, that of spontaneity. This umbrella of uniformity encompasses all aspects of the capitalistic corporation within the arts and culture industries. Radio, for example, is tightly linked to the concepts of various formats: rhythm and blues, jazz, soul, rock, rap, classical, and talk. Any configuration outside of this predetermined construction fails. Likewise, film adheres doggedly to the characteristics of certain genres (horror, comedy, etc.), a formulaic blueprint that guides virtually every twist of the story plot from the opening sequence to the last frame. Indeed, film students are required to memorize the particularities of each genre, encouraged to create products that fall exactly within the specified guidelines. The culture industry of Hollywood then rewards filmmakers best able to play to the dictates of the genre with Oscars, a reinforcement that further encourages the redundancy of filmic products.

Pseudo-individuality is connected with the concept of standardization. The idea suggests that there is nothing new (or original) under the sun, despite the efforts of culture industries to sell 'freshness' and a belief in the idiosyncratic nature of a creative product or talent. Adorno charges that pseudo-individuality is just as applicable to the individual 'film star'. All virtually clones of the other: hair, eyes, voice, figure; anything even vaguely different about the self is mandated as a tightly controlled monopoly commodity determined by society, with 'every single person transformed by the power of generality'.[7]

Pseudo-individuality entails what could be termed as the colonization of the artist. The artist, the creative individual, succumbs to the forces of the powerful and loses his/her identity as a self-dependent producer. From a self-actualizing process, art turns into a mere means to an end, namely profit. In the final analysis, the 'talented performer' and 'the attitude of the public' form a unified whole within the culture industry. Thus culture loses its aesthetic significance.

The imprint of pseudo-individuality and standardization make for a complex psychological component: such familiarity with form and content breeds a kind of dullness in the recipient, thus creating a passive and fairly uninspired cultural consumer (reader, viewer, listener). This passivity, which Adorno called *regressive listening*[8] presumably lulls people into a mind state that would allow them to accept the status quo and succumb to authoritarianism. This populace thus becomes an unmindful 'mass' capable of being hoodwinked and exploited by capitalist corporations or autocratic systems of administration.

## NEW SOCIAL MOVEMENTS

It is clear that the culture industry has not achieved a total victory over society, as Adorno and Horkheimer would like us to believe. One of the unforeseen consequences of the culture industry has been the proliferation of collective actions that have emerged as a result of the conflicts within the 'domains of cultural reproduction, social integration and socialization.'[9] These collective actions (including movements in favour of the environment, gay rights, and women's rights) defy 'colonization of the lived world', the interventions exercised by formidable social structures, such as the state, in the operations of everyday life. Because the loss of meaning and freedom is the fundamental concern of these collective actions, sociologists refer to them as 'new social movements'. 'Old' social movements, including the labour movement, focused primarily on political and economic issues. Unlike 'old' social movements, new social movements are conditioned by 'post-materialist values' that have come as a result of the structural changes engendered by both Fordism and later post-Fordism.[10]

## POST-FORDISM

This term refers to a new regime of accumulation that has emerged as a result of the weaknesses of Fordism.[11] The mismatch between effective demand and mass production, the rising cost of labour, and changes in consumer behaviour constituted some of the major problems that Fordism failed to address. Accordingly, post-Fordism emerged as a system with distinct characteristics. In essence, in contrast to its predecessor, post-Fordism is highly flexible, owing to several factors. First, the new system is geared towards the production of highly specialized products. The scheme of mass production that focused on the manufacturing of standardized products had to be transcended. This in turn gave rise to a mode of organization that allowed the very existence of different styles of production. Secondly, the flexibility in production is contingent upon flexibility in labour, requiring workers to possess more skills than under the Fordist system. The post-Fordist worker is sufficiently resourceful to make adjustments whenever and wherever deemed necessary. Ultimately, as a result of the new adjustments that have taken place, post-Fordism responded to the calls of the market. The proliferation of different types of products met the needs of the new consumer society, whose members' behaviour is cultivated and regularly reinforced by advertising.

## GLOBALIZATION AND PRODUCTION

The heightened consumerism that resulted from post-Fordism was further buttressed by globalization in three distinct ways.[12] First, globalization has engendered the very existence of transworld articles. Consumer articles, such as Coca Cola and Sony electronic products, have penetrated almost every part of the planet. Secondly, contemporary technology has shaped international consumer behaviour.

Air travel, electronic mass media, and online communications have been instrumental in paving the way for consumer consumption of colossal proportions. Lastly, the global context has set the stage for the glorification of 'commodification'. Thanks to today's transnational mass media, international events, such as the World Cup and the Olympic Games, allow consumerism to flourish extensively. By and large, globalization is a new phenomenon to the extent that the development of international capitalism has brought a qualitative change 'in the trade and transfer of capital, labour, production, consumption, information, and technology'.[13] However, globalization has not changed the fundamental characteristics of capitalism. Instead, its impact is limited to deepening supra-territorial interconnections to an extraordinary degree. David Harvey describes this process as 'time-space compression' with 'a disorienting and disruptive impact upon political-economic practices, the balance of class power, as well as upon cultural and social life.'[14]

## GLOBALIZATION AND CULTURE

Scholars disagree on the impact of globalization on the cultural and social life of the peoples of the world. The two opposing views on the effects of globalization on culture are centred on the notions of 'cultural synchronization' and 'globalization'.[15] The former refers to the universalizing impact of globalization. Globalization is believed to have introduced 'a single world culture centred on consumerism, mass media, Americana, and the English language.'[16] On the other hand, those who uphold globalization contest this universalizing impact. According to this view, globalization, far from creating a uniform international social system, has paved the way for the enhancement of cultural pluralism. Different societies have adapted to global processes in accordance with the specific conditions of their respective situations. Certainly, 'many groups have championed national, religious and other particularisms as a reaction to and defence against a universalizing 'McWorld'. [17]

## VOICES OF DISCOURSE

Jensen asserts that it is impossible to study culture as a product of non-interpretive forces. Rather, the forces which make up the character and nature of cultural materials are determined by the assumptions, biases, and beliefs of the producers about their work, the audiences, the times, the genres. Cultural material is not 'processed' like soap by organizational, technical, and economic 'factors'.[18] In addition, Collins rejects the critical theorists' view that culture is primarily produced by a power elite. Indeed, the opposite seems to be true. The production and consumption of culture occurs in a decentralized and unforeseeable way as a result of a variety of cultural discourses.[19] It is therefore impossible, according to Bjorkegren, to achieve totalitarian control over production and consumption of the arts.[20] Hebdige sees music consumption as a site of creativity and resistance to the dominant social order.[21]

While it is true that the so-called New Age music of the last two decades was created for the exclusive purpose of soothing and lulling the listener into a kind of a meditative state, rap music, on the other hand, which was created primarily to agitate, has radicalized the industry. Speaking

to and from the disenfranchised, and created by marginalized black American youth that viewed themselves as rejected by and invisible to society at large, rap music serves as a scathing, subversive, musical menace to society. Unapologetic in its loathing of agents of authority – especially the police – its sentiment flies in the face of everything that Adorno would hold dear. So poignant and far-reaching are the messages embodied in the acerbic lyrics, that rap has come to be embraced as the global music of protest.

Especially in light of the worldwide proliferation of rap music, many scholars firmly reject Adorno's views that music pacifies and otherwise hypnotizes the listener into accepting authoritarianism. American essayist Cornel West asserts that African-American music is first and foremost a 'countercultural' practice with deep roots in political opposition. As such, it serves well to give voice to 'rootless and alienated young people … dissatisfied with the status quo.'[22] Researchers Basu and Werbner echo West, and reiterate that the initial roots of hip hop music as an art form had more to do with the airing of black voices of dissent. It was only later that the phenomena of the international proliferation of the music made its creators successful entrepreneurs. They agree that for African-American youth, hip-hop was a protest art form, and as such, 'became a new form of expressive culture that was tailored to the historical circumstances and existential desires of black ghetto dwellers.'[23]

By the end of the twentieth century, other scholars served up harsh criticism of Adorno's ideology. Gendron argued that his analysis ignored the inherent differences between text (written or oral) and functional artefacts (i.e. paper, recordings, CDs). While text is 'universal', a functional artefact is a 'particular,' yet to be marketed and possessed, and every universal text must be embodied in some functional artefact. While he acknowledges that the functional lends itself to assembly-line mass production, 'one simply doesn't mass produce universals … Thus, whatever the technological state of the culture industry, the assembly-line is simply an inappropriate model for the production of texts as universals.'[24]

New voices continue to debate Adorno and Horkheimer's original premise, and this debate may well evolve over the next several decades. For Protherough, an ardent detractor of Adorno, the ultimate question remains: 'Is Culture an Industry?' He insists that it is not. To be an artist is idiosyncratic; most are underpaid transient workers on temporary or part-time contracts. Most are self-employed. What they do is essentially individual, not mass-produced. Works of art are not mechanically turned out and sold like other manufactured goods, and art producers sell potential experiences rather than material 'products.' Finally, he writes:

Ten people who buy a particular brand of toothpaste all get the same product at the same price; ten people who see a play or a sculpture all receive distinct impressions and respond to them differently. Audiences are active and selective in the way they react to and interpret books, music, and paintings. Art 'goods' therefore have no 'value' until personal reactions and critical debate create it.'[25]

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# 25.5
## CULTURE AND POLITICS

*Anne Legaré*

In studying the links between culture and politics, several approaches may be adopted. Politics, in the modern sense, primarily concerns the state and its action, although it is generally accepted that the state is the outcome of struggles arising in the private sphere of life. Culture encompasses two opposing domains: civil society, which is rooted in diversity, and the state, which tends to seek cohesion.

Culture may be incorporated in state reasoning through the legitimization of dominant cultures via direct action in the private domain (assistance, financial support and selective means of enhancing cultural productions) or, on the contrary, through refusal to grant recognition, exclusion from the scope of legitimacy, or even censorship, prohibition and all forms of repression. Accordingly, on the one hand, 'culture' designates representations expressed by structures, practices and codes or embodied in forms of behaviour that distinguish places, eras and peoples from each other as a result of a series of socio-historical processes and, on the other hand, it encompasses a range of practices that are outside the realm of politics and the state. In fact, art, being both creation and invention, is produced in an imaginary space, which definitely requires freedom and does not necessarily relate to reality. Politics and culture may then come into conflict. The links between the two may concomitantly be integrated, harmonious or conflictual.

In the twentieth century, the primacy of reason in the field of politics constituted the main link between culture and politics. The fundamental importance ascribed to reason was based on the belief, advanced by the moderns in the eighteenth century, that it was possible to extract from reality its inherent rationality. Science was used to demonstrate that reality could be rationalized and thus transformed by the power that it derived from the exteriority of reason. State domination over society took the form of belief in the inexhaustibility of the rationalization of reality. The twentieth century was marked by the conquest of reality through reason and of the social realm by the political sphere, as formulated by the Rationalists during the Enlightenment, and by the corrosive power of capitalism and the increase in inequalities. Relations among states and between states and cultures were influenced by the new dogma. The power of reason over reality and the critical awareness derived from

exteriority were the conditions on which the state's relative independence from society rested. Liberal countries drew on this autonomy when instituting the conditions for freedom and equality before the law. Relative autonomy was also invoked in transforming the state into an instrument governed by class rationality or the logic of domination. A new culture of politics emerged among the states that regarded the break with tradition as the hallmark of absolute faith in the power of the human mind.

The dominant states, custodians of the new hegemonic culture, sought to extend its standards to all political, cultural and social relations and to ensure that the break with the past made eighteenth-century Europeans spread worldwide. Those states hoped to impose a conception of law that placed it in a position of exteriority overseeing religion, culture and individual interests, which were regarded as private matters. The new philosophical culture and that vision of domination pervaded relations between state and society in the dominant countries, and attempts were made to incorporate them into all international political relations. Existing tensions between the centre and the periphery, caused by economic and political inequalities, were exacerbated by efforts to impose a culture of reason and state rationality from which all belief and tradition had been expunged thereby placing the matter outside the political arena.

Born of philosophical thought by the moderns, particularly Kant, Hegel and Fichte, the primacy of reason was defined as will or action on a society viewed in a context of relative independence and exteriority. Politics was regarded as the expression of power that could change society rather than as an internal force that recognizes, either in the name of God or a higher authority, a community bound together by a belief or sense of belonging. In return, modern society broke with the unanimism sought by the community of the ancients and became a focus of division and conflict between a variety of rationalities and a unifying rationality, that of the state. The transcendency of reason, a sign of its exteriority and critical position or ability to transform reality, marked the twentieth century. This product of Western modernity had an effect on the rest of the world where, under cover of proclaimed liberalism, the

will to master reality was closely linked to a balance of power between unequal forces.

The cultures of regions under such domination were confronted with the need to reconcile their ways of organizing and conceptualizing reality with the predominance of the Western culture of rationality, firmly rooted in the predominance of the law and in all the practices of social management, which were dominated by technological adaptability. Accordingly, Western systems patterned on a liberal conception of politics increasingly turned to knowledge while political ties elsewhere continued to be modelled on a religious community of beliefs. In those societies, culture took precedence over politics. The Arab Muslim countries, for example, were isolated by the profound difference wrought by an order whose legitimacy was based on a tradition that deferred to a superior source of explanation through recourse to faith. This culture of obedience was confronted with the civilizational divide that occurred when people in the twentieth century became aware that the mind was independent of reality and its representations. There were different models of civilization in other parts of the world, such as Africa, Asia and Oceania, but the culture of modernity established in the twentieth-century West laid the foundations of a politico-cultural hegemony and sought to spread it to all regions and all cultures, both Eastern and Western.

The new political culture, widespread in the West, caused conflicts with and within other regions and greater incomprehension between the centre and the periphery, between regions of the world separated by increasingly divergent visions and between equally legitimate and different civilizations. The unequal development of the North and the South and of the East and the West, in addition to deep cultural differences, exacerbated those inequalities and hampered the dialogue initiated between the different models of civilization. Attracted by the prosperity of the dominant countries and hoping to overcome inequalities, traditional states strove to reconcile their practices with the demands of modernity, thereby creating tensions within their own population.

At the same time, the political culture of modern states was marked by various divisions. Such a society, capable of rationalizing its own will, was characterized by three forms of political culture that were evident in the growth of modern democracy in the dominant countries and its claims to universality, which were clearly set out as a blueprint for civilization. The importance ascribed to human rights in Britain, the institutionalization of citizenship in the United States and republican equality in France, both universally and individually, marked these different models of political culture that brought together the inseparable components of the same conception of politics as a means of rationalizing social relations. Each cultural form of rationality adopted by the liberal states reflected, in its own way and to varying degrees, the constituent elements of democracy, freedom, equality and solidarity. Modernization was not, however, confined only to countries permeated by the democratic ideal from the outset. Other countries – Japan, Turkey, Brazil and India, for example – drew on the state's regulating role in their efforts to modernize and rationalize relations with those societies.

In the dominant countries, yet another form of differentiation in the political culture could be distinguished. With the independence of reason reigning supreme in these countries, the struggle to gain recognition for cultural diversity pitted liberals against republicans – the former, as defenders of world standardization through abstract equality established by law, and the latter, as champions of the distinctive interests of groups claiming cultural specificity and relative differentiation. Both modernization and development characterized the twentieth century, as did a deep-seated clash of civilizations that made cultural diversity a key issue at the heart of political conflict.

Furthermore, for two-thirds of the century, attempts were made to extend yet another conception of the role of reason and of the state to regions of the world not yet touched by the liberal model of rationalization of politics and which were the object of imperialist designs. Marx, Kant and Hegel all recognized, albeit in different ways, the strength gained from the relative autonomy of the mind. A vision derived from nineteenth-century Marxism was imposed on Eastern Europe under an authoritarian and centralizing Marxist conception of the role of the state, which stemmed from the break made by the Enlightenment and the rejection of tradition. That culture of domination, based on the will to ensure identity between the society and the state, spread to South-East Asia, mainly China, and to countries of the South during decolonization struggles. An entirely new culture of rationality was used in this way to promote the movement to revolutionize social relations by abolishing social classes and the class struggle. The rationalism of the Enlightenment found new expression through this form of totalitarianism. The *principle of identity* between reality (society) and reason (the state) vested a higher principle of rationalization in the necessary dictatorship of the revolutionary class, the proletariat. Seeking to transform the world, historical materialism, which placed the class struggle over all other representations of reality, entailed dictatorship under this new theoretical model. Democratic centralism in Europe therefore created the 'Gulag', an extreme form of the culture of reason.

The dictatorship of reason also culminated in the other form of totalitarianism known as fascism. The quest for identity between the political nation and the actual society, leading to the fantasy of 'national' purity promoted under the regimes of Mussolini or Hitler, informed the 'scientistic' excesses for rationalization and led to its destructive potential and its downfall. There exist several extreme examples in the twentieth century, such as the concentration camps, the extermination of the European Jews, Nazism, acts of genocide, the repression of the Kurds by Turkey in the name of the unity of the Turkish nation, the imprisonment of opponents in Siberia, and the use of prisons and psychiatric hospitals purportedly to treat various forms of mental illness. These abuses of 'scientism' shattered the modern illusion of the general good. These extremes, described by the Frankfurt school as the 'eclipse of reason', harbingered the crisis that would strike at the very foundations of modernity.

The ultimate authority of the people (Argentina), the proletariat (Russia) and the nation (Germany) were invoked to impose repressive dictates on society or on different cultural or social groups in the name of unity, national cohesion or the Revolution. Such abusive excesses of belief in the supremacy of will and reason ran counter to freedom of the individual and the pluralism of civil society vis-à-vis the state. The rejection of all claims to the established truth, whether embodied by fascism, the Chinese Cultural

Revolution or Soviet-style democratic centralism, characterized this phase of modernity.

The century was also marked, however, by cultural censorship, which illustrated the totalitarian trends underlying the unbridled recourse to the will to rationalize and master reality. Two main issues were identified. First, cultural expression could be defined as a form of self-recognition in a context of immanent relations, in other words, free and independent of the institutional hierarchy. On another level, the primacy of reason over reality and of the state over society meant that knowledge and science were separate from reality, which they could therefore form and inform. In certain cases, the subordination of art and artistic practices to the state's designs led to action contrary to the principles of autonomy and pluralism of civil society. Whereas culture, the ideal form of expression of the principle of freedom, should have been protected from the authority of those in power, certain states sought to censor, control and ban creative imagination.

There were several examples of such excesses. The Nazi regime was no doubt the one that deployed repressive state structures most systematically against culture and creation. The persecution of left-wing writers and composers and the destruction of books were but a few of the means of oppression used against creators in the name of supreme rationalization and the will to ethnically cleanse Germany and exterminate the Jews, inspired by deep-seated, albeit irrational, anti-Semitism. In the last few decades of the century, the emergence of *Berufsverbot* policies against East German intellectuals and artists left them without work. In the former Soviet Union, repressive state action against thought and creation characterized a regime that sought to make all Soviet citizens no more than the cogs of the revolutionary class, the proletariat. This pretext was used after the 1917 Revolution to expel large groups of intellectuals in 1922. The Communist Party of Leningrad persecuted writers such as Zoschenko and Akhmatova, and the literary journal *Zvezda* was banned.

In an opposing political view, the threat of communism was used to justify the witch-hunt that characterized the McCarthy era, named after the US Republican senator Joseph Raymond McCarthy, in the early 1950s. Hollywood actors, famous writers and directors such as Charlie Chaplin, suspected of communist sympathies, were banned or persecuted. Curiously enough, the protection of the values of freedom was one argument used to justify those acts of censorship. In fact, security featured prominently in discourse towards the end of the century culminating, after the tragedy of 11 September 2001, in the adoption of measures to control and monitor thought and many forms of cultural expression (the Patriot Act). These measures were evident or obvious to varying degrees and promoted the idealization of an exclusive political model.

We must also mention the destruction of Afghanistan's Bamayan Buddhas, figures of alterity and of a religion intolerable to the Taliban extremists. The temporal demolition by human beings of purely symbolic human works illustrated the extent of the absolutism of the will to subject the field of representation to prohibitions rationalized by man. The case of the *fatwa* (death threat) pronounced by Iran's religious authorities against writer Salman Rushdie in the late 1980s was another example of the power that politics attributes to culture and creation, fearing that they express an uncontrolled and discernibly subversive freedom.

As we have seen, totalitarianism usurped the principles of rationalism in the first half of the twentieth century. Yet, the positive values of freedom that had determined the autonomy of economic activity subsequently led to globalization, that is to say, the creation of a global economy increasingly independent of states. Economic and social progress and confidence in political authorities committed to reinforcing social relations while ensuring respect for diversity guided efforts to bring in a new modern era. That illusion notwithstanding, in the last third of the century, the gap widened between the logic of a globalized market in the West and the cultural worlds demanding the recognition of individual and collective identities. A deep-seated cultural crisis had begun.

One of the first consequences of that development was the explosion of mass culture, caused by the general overemphasis on freely satisfying needs and tastes. Disillusioned by the inflated growth in trade and in the resources available to cater to its insatiable appetite and unbounded selfishness, society entered the first stage of the contemporary crisis of modern rationality by expressing deep disenchantment. That crisis was followed by anguish over the loss of benchmarks, as technology gained the ascendancy to the detriment of human and social values. Radical modernity led to absolute relativism. This latter form of Western counter-culture broke with the very idea of society as a unified whole. Society was merely a combination of desires and interests, with no discernible centre. Cultural parameters then broke down when all trace of triumphant unity was lost. As a result, the social forces that might have rebuilt modernity on new bases grew steadily weaker.

The increasingly frequent recourse to human nature and an emphasis on human impulses was portrayed, in art and films in particular, both as excess or abuse and as somewhat inevitable. In the United States, religions were on offer as market products, and everywhere, in France, Italy, the United Kingdom and the Netherlands, sexuality became a commodity. This was accompanied by the reification of an unlimited conception of consumption because of the heavy emphasis on the market as the new social regulator. Rationality was thus subordinated to consumer demands for the symbolic attributes of individual and collective differentiation.

Culture and politics were founded on liberalization based on market logic only. In the field of knowledge, organizational skills and private and public management science featured more and more prominently in scientific and social thought in order to adapt to and master the new demands of a free-trade society focused on meeting its needs. The workplace and enterprise therefore came to be regarded as new centres of knowledge. Management science was first listed as a university subject in the United States before all Western countries followed suit, thereby establishing business management as an organizational model for the state and for society as a whole. Compared to this managerial conception of universal matters, national and state sovereignty was an empty reference. The twentieth century therefore tended to be the century of heterogeneity in which individual aspirations clashed more and more with all integrative principles. Representation of the world as a whole unified by the market became the new symbolic construct, and it obscured the increasingly profound and real social and cultural differences between people and identities.

Attempts were made to establish new conditions of differentiation and dialogue between the cultures of hypermodernity and traditional cultures. The tragedy of 11 September 2001 showed that it was impossible for certain forms of anti-modern culture to be expressed in the language of modern democratic institutions. The forms of fanaticism that burst onto the international scene as exemplified by Afghanistan's Taliban, Saudi Arabia's Wahhabis (whose influence spread to the West), or suicide bombers who believed in the idealization of certain verses of the Koran, were a means of expressing what was felt to be inexpressible in the language of modernity. Those extremist movements in pre-modern cultures opted for violence, hatred and sacrifice rather than compromise, which they considered inconceivable.

The latter phase of the twentieth century was marked by a new and deep rift between civilizations, signalling the retreat of the universal values of equality, liberty and solidarity. The extension of rights and freedoms in modern states was confronted with relativism, which trivialized all democratic accomplishments. Owing to the tensions identified, a distinction could be drawn between modernity, whose basic premises failed to gain sway, and the limits of modernization imposed from outside on societies founded on the 'cult of the ancient', in which rationality rested on the coherence of revealed truths.

Freedom of thought, conscience and action, and respect for the exercise of those values by others – in a world in which communications permitted unlimited contact – created conditions for mutual tolerance, which was vital for the peaceful coexistence of dissimilar cultures. For such a dialogue to be successful, freedom of conscience and action could not be left to the atemporal order mediated by theologians, but had to be ensured increasingly by the political process. Followers of Islam, for whom subjectivity inhered in obedience, which effectively barred them from any subjectivity, drew closer to the culture of criticism through modernization, literacy, birth control by women and the general provision of education. The identity of thought shared with the West on those matters restored a measure of authority to the power of reason over real-life conditions. Such closer ties marked the end of the twentieth century.

The need to move forward from an incomplete liberal democracy was clearly identified in other parts of the world as well. Subjectivity therefore had to be viewed in relation to a crisis that everyone faced in different ways. Westerners, who enjoyed freedom but were constrained by the reification of the imagination in the materialistic strength of supply and demand, had to regain freedom and awareness as the architects of the institutions that determined the way they related to freedom, equality and solidarity. Social movements, such as feminism and the promotion of cultural identities, and movements in defence of alternative world views rallied to the cause of renewable freedom at the end of the twentieth century.

The various levels of opposition between the two main cultures of politics, one based on the transcendency of reason under the liberal model and the other shaped by the immanence of a community of belief and tradition, continued to be linked to highly unequal social development detrimental to the weakest. They needed to be addressed politically in the context of a new universalism based on dialogue rather than to be reduced to power conflicts between models of civilizations. On the one hand, in the internal crisis of modernity, the various forms of rational determinism were widely called into question. Doubt and the reflective identity of the modern mind had fostered openness to critical awareness focused on changing conditions rather than on veneration of a social order rooted in immutability or revelation. On the other hand, intersubjective dialogue between traditional cultures and cultures that had introduced secularization and the separation of politics had to be initiated in order to end worldwide tension between culture and politics. Awareness of cultural diversity, encompassing beliefs, religions, philosophical representations and the thirst for domination, stands out as the key issue in the social and political transformations of the twentieth century.

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# 25.6

## CULTURE, THE ARTS AND SOCIETY
### INDIVIDUAL FREEDOM AND EXPRESSION

*Anisuzzaman*

## CENSORSHIP AND SOCIAL CONTROL

The issue of individual freedom and expression in the fields of culture and the arts in relation to society is extremely complex. First, it is intimately connected with the basic political questions regarding freedom of the individual and freedom of speech. Secondly, special privilege has been claimed for the artist and cultural actors on the ground that art forms cannot flourish without freeing creators from all constraints. The state, however, has found it expedient to defend itself and its favoured institutions (such as the Church) from attacks by individuals and groups and to protect its citizens from what it views as obscenity, violence and horror.

For centuries, societies have attempted to impose restrictions while at the same time freeing themselves from such controls. A landmark in this struggle in Britain was the ruling of the parliament of Henry VIII in 1534 that treason may be committed 'by words or writing'. A quarter of a century later, the Catholic Church compiled a list of proscribed books, the *Index Librorum Prohibitorum* – a practice which has existed in various forms since the fifth century. In 1642, the Lord Chamberlain took over as stage censor. Two years later, John Milton's *Areopagitica* appeared as a passionate defence of free speech and cogent argument against censorship. In Britain, censorship was abandoned in 1695. From the days of Milton, however, a succession of thinkers, notably many eighteenth-century British and French philosophers, have voiced their concern for freedom of thought and speech. It was in this context that the First Amendment of the Constitution of the United States was enacted in 1791, guaranteeing Americans freedom of speech, based on the British parliamentary privilege, and freedom of the press. Although it was aimed at granting political freedom, the amendment's scope has been extended to all kinds of cultural forms by judicial decisions in the last two centuries. Meanwhile the Universal Declaration of Human Rights, adopted by the United Nations in 1948, succinctly grouped all such freedoms under the heading of 'freedom of opinion and expression' and made it obligatory for the signatory-state to accord this freedom to all its citizens.

The argument for intellectual freedom rests mainly on the primacy of the individual, a concept on which there is not universal agreement. A society is composed of individuals and, in order to function as a society, it demands conformity from the individuals. The individual, on the other hand, may wish to free himself from any or all restraints imposed by the society. While the society aims at self-preservation and the protection of traditional values, the individual voices dissent. Ideally a balance should therefore be struck between rights and duties of both parties. However, as history has demonstrated, this is extremely difficult to achieve. In most cases the conflict ends either in the destruction of the individual or a gradual change in the standards of society. The best one can hope for is that, 'Out of this dichotomy of society and the individual, the tension between the many and the one, must come whatever success there really is, what progress is possible in the future, as in the past.'[1]

Society has various ways of controlling recalcitrant individuals or cultural expressions that challenge its traditional values. Leaving aside the state that imposes censorship of one kind or another, and the Church that prescribes or proscribes, private groups are often formed to act as guardians of public morality. The broadcasting media in the United States is particularly susceptible to private pressures. Groups such as the Citizens for Decent Literature, Daughters of the American Revolution, the General Federation of Women's Clubs, the John Birch Society and the National Legion of Decency have assumed the role of community conscience-keepers in the United States. They have demonstrated their disapproval by burning books and picketing movie houses. In Britain, there are such groups as the Catholic Teachers' Federation and the Public Morality Council, but these are not as influential as their American counterparts. In many cases, individuals, such as Mary Whitehouse, have been more eloquent and successful. Often crowds choose to publicly register their disagreement. In Bangladesh, India and Pakistan, crowds have angrily demonstrated against an author or publication of a book. In 1944, Pablo Picasso's announcement of his decision to join the Communist Party was greeted with unfavourable demonstrations in Paris. Local authorities, both in the United States and Britain, have used their powers to censor

plays and films and to remove certain books from the public or school libraries. The authority to choose school textbooks has been seen by many as a process of thought-control. There has been much advocacy for testing literature and other art forms by 'contemporary community standards' as distinct from 'national' ones. The judiciary in the United States, however, has defeated such claims. Opposed to the attitude of these groups, the American Civil Liberties Union, the American Library Association (particularly its Office for Intellectual Freedom Committee) and the Freedom to Read Foundation have forcefully campaigned for unlimited freedom in the material Americans can read, hear and view.

The system features several kinds of built-in pressures that might come into play. Publishers are capable of exerting economic pressures on the author. It is sometimes feared that the economic pressures faced by American authors 'can seriously affect the contents of their writings'. Booksellers and the Newsagents' Federation in Britain are known to have refused to distribute particular publications or to launch a new newspaper.

The pressure on the media appears to be greater. Just as the owners of newspapers can exert economic pressure on working journalists, the advertisers – be they private or government – are in a position to pressure the newspapers in regard to content. Outside pressures, though informal, have often influenced the media. Internal controls and self-censorship may also operate.

Among the pressures allegedly exerted by the BBC are the ban on a record by Petula Clark for a veiled reference to God, the removal of Malcolm Muggeridge and Lord Altrincham following their comments on the monarchy, and the ban on Noel Coward's records. The BBC is also believed to have periodically compiled lists of forbidden subjects for the benefit of its producers. The Independent Television Authority (ITA) is on record for having refused advertisement of the *Daily Worker* and the telecasting of films by the Institute of Directors for political reasons.[2]

It has been observed that 'the dominant social ethos of private enterprise creates its own constraint: if the British media are rooted in a broadly based social control, American media organizations are bound by powerful economic control mechanisms which exert tremendous influence on both the organizational context of media production and the nature of media output'.[3] The most common impediment to freedom of expression comes in the form of government censorship – not only in time of war, when truth is often sacrificed, but also in peacetime, when the dominant social, political and moral ideologies shape the mind of the censor. We can identify three basic patterns of censorship: preventive censorship, punitive censorship and censorship at the source. The most common form is preventive censorship, in which a piece is censored before dissemination. Punitive censorship does not restrict dissemination, but the person responsible is liable to prosecution by an individual or government in a court of law. The censorship at the source generally applies to the media and involves someone with political or military authority making sure that the facts are concealed for political or strategic purposes.

Interestingly, there is a wide spectrum of views with regard to freedom of expression and censorship. The Freudian approach, for instance, tends to find censorship as both immutable and implacable, rooted, as they are, deep in the human psyche even though they might be fundamentally antagonistic to the desires and needs of the individual. Herbert Marcuse identifies freedom of expression as an ideological construct with specific functions in Western democratic societies and cultures that can be effectively countered by a form of censorship that is creative rather than repressive. Michel Foucault maintains that, in the context of sexuality, censorship plays a more subtle and paradoxical role than the prohibitory one in that it can incite more than prohibit. A recent study puts forward the view that literature is the result, rather than simply the target, of censorship pressure, and thus we are partly in debt to censorship for our concept of 'literature' as a kind of discourse with rules of its own. Another scholar has observed that censorship makes the artist imply rather than state his message directly, instilling the work of art with a subtlety which, in turn, quickens the imagination of the reader or viewer. According to some other authors, three points need to be noted on censorship: (1) that it is present even in texts that seek to elude it, (2) that it is a notion of extraordinary potency, and (3) that we define ourselves as readers, writers and as citizens through it.[4]

Support for censorship has come from some unusual quarters. A number of leftists, for instance, have supported the censorship of racist writings, while a plea has been made to purge racist and sexist ideas from children's reading material. Many feminists favour the suppression of pornography on the grounds that it degrades women. In this case, some of them have joined hands with conservative anti-pornography campaigners who are anxious to protect 'the family' not only from pornography but also from the onslaughts of feminism.

Some hold that 'in its regulation of obscenity, horror and violence, it [censorship] will have universal support, but not in an interpretation of 'offensiveness' which appears to be unduly deferential to monarchy, the Church, and similar institutions.[5] Similar expectations are nurtured for censorship of films: 'The desire to protect the public – the viewers – from depiction of excessive erotica or violence is a concern held reasonably by many reasonable persons'.[6] Others appear to be surer of their grounds for optimism and support for what some[7] have designated as 'censorship of enlightenment': 'there is a consensus in society that displays of violence and sex, publication of personal attacks, some information about government policies and so on should be withheld from the general public'; there is also an 'agreement that laws which prevent people from inciting violence through racist publications or speech are a good thing'.[8]

The fact remains, however, that there is a fairly strong opposing viewpoint holding that the 'democratic philosophy is based on man's ability to reason and decide for himself his own best interests on his educability, and on his conscience', that 'Obviously censorship denies each of these', and that nothing should be withheld 'no matter how hateful or hurtful the idea may be to some individual or group'.[9] The Freedom to Read Statement, issued in 1972 by the American Library Association and the Association of American Publishers says: 'Parents and teachers have a responsibility to prepare the young to meet the diversity of experiences in life to which they will be exposed, as they have a responsibility to help them learn to critically think for themselves', and 'These are affirmative responsibilities, not to be discharged simply by preventing them from reading works for which they are not prepared. In these matters, taste differs, and

taste cannot be legislated; nor can machinery be devised that will suit the demand of one group without limiting the freedom of others'.[10]

Perhaps it will not be out of place to end this debate by bringing in the controversy over the relation between the representation of violence and sex in the arts and the media and crimes of similar nature in society. A British study tends to show that 'reporting of terrorist acts has engendered similar acts' and 'violent films' have led to initiative acts of violence.[11] On the other hand, the National Commission on Obscenity and Pornography, appointed by the President of the United States in 1967, found that the 'analyses of United States crime and illegitimacy rates do not support the thesis of a causal connection between the availability of erotica and either sex crimes or illegitimacy'.[12] What both sides agree upon is that the matter is 'probably impossible to calculate' and that 'the data cannot, however, be said absolutely to disprove such a connection.'

## CENSORSHIP AND PERSECUTION OF PERSONAL CONVICTIONS

It is beyond the capacity of a single author in the present chapter to trace the development of censorship on a global basis from 1914 to century's end. We thus propose in the following pages to examine certain countries, at varying periods, to present a general notion of how authorities have imposed restraints on an array of cultural forms and the media and their contributors and how the latter have responded to such pressures.

We will begin with the case of the United Kingdom. During the First World War, the authorities possessed two weapons to 'effectively restrain editors from publishing materials bearing certain restrictive designation'.[13] These were the Official Secrets Act of 1911, updated and reinforced in 1920, 1939 and 1988, and the system of 'D' notice. It has been alleged that both means were used for matters that had nothing to do with either leakage of official secrets or endangering national security. In 1935, the prestigious auction firm Sotheby's was unable to sell original letters of Lord Nelson to the Duke of Wellington on the grounds that they contained 'official secrets'.[14] By using these same provisions, a reporter of the *Daily Dispatch* was convicted in 1938, the *Daily Worker* was suppressed in 1941 and the *Daily Mirror* was officially threatened with suppression in 1942. The censorship was removed once the war ended, but the committee set up to deal with the press in wartime had survived the war. But then the Cold War had developed, prompting the government to introduce special measures. Such measures led to dismissal and suspension of civil servants and put tremendous pressure on a major firm to dispense with the services of its assistant solicitor because it was found that his wife had been a communist.

It is worth mentioning here that the pacifist activities of Bertrand Russell in the First World War years led to his being fined in 1916, his dismissal from lectureship at Trinity College, Cambridge, six months' imprisonment in 1918, and incarceration again in 1961, for anti-nuclear protest.

In 1923, the United Kingdom signed an international convention for the suppression of the circulation of traffic in obscene publications, which resulted in an increase in prosecutions for obscenity. The government moved the court in 1928 for an order to destroy copies of Radclyffe

Hall's novel *The Well of Loneliness*, which was described by the attorney-general as 'lesbian propaganda'. Having refused to admit expert evidence, the magistrate ordered its destruction. A gradual cessation of prosecution of literary works was noticed in the next quarter of a century, but it was revived in 1954. Curiously enough, *The Decameron*, by the fourteenth-century Italian writer and scholar Boccaccio, was ordered to be destroyed. The same year *Julia* by Margot Bland, *The Philanderer* by Stanley Kauffmann, *The Image and the Search* by Walter Baxter, and *The Man in Control* by Hugh McGraw were among the works prosecuted with a varying measure of success.

The persistent attacks on literature led the Society of Authors to set up a committee, with Sir Alan Herbert as chairman. The committee produced a bill for reform of the law, which was introduced in the House of Commons, but nothing came out of it. Two new laws – The Children and Young Persons (Harmful Publications) Act and The Obscene Publications Act – were adopted in 1955 and 1959 respectively. The latter made an attempt to distinguish literature from pornography.

Under the Post Office Act of 1953, postal authorities seized copies of *Lady Chatterley's Lover* by D. H. Lawrence, which had been banned in the United Kingdom since 1930. Under the new Obscene Publications Act, the first prosecution was brought out against this book in 1960. Having accepted the expert evidence, however, the jury acquitted the work. In 1964, the eighteenth-century novel *Fanny Hill* by John Cleland was banned. The government made an unsuccessful attempt to persuade the French authorities to suppress the publication in France of the original English version of *Lolita* by Vladimir Nabokov, a novel first published in the United States, although the work was never prosecuted in the United Kingdom. A bookshop in London was prosecuted in 1988, under the Customs and Excise Act of 1876, for catering obscene materials to the public, and the objectionable matters included some medical books and works by Oscar Wilde and Kate Millet. Similarly, customs authorities seized the works of Jean Genet – the French petty-criminal-turned-great-literary-figure (and saint, according to Jean-Paul Sartre) – in the original French. The second edition of *Ulysses* by James Joyce met a similar fate. Irish customs seized *The Observer* because it contained an article on family planning, and the Australian customs seized copies of J. P. Donleavy's comic novel *The Ginger Man*.

The 1988 publication of *The Satanic Verses* by the Indian-born British author Salman Rushdie created a worldwide furore. Considered by Islamic fundamentalists as blasphemous, particularly in its depiction of the Prophet Muhammad, the book was banned in a number of countries with significant Muslim communities and burned by Muslims in Britain and elsewhere. The sharpest reaction came from the Ayatollah Khomeini of Iran, who immediately condemned its author, editors and publishers to capital punishment and called on 'all valiant Muslims wherever they may be in the world to execute this sentence without delay'. Rushdie was forced to go into hiding, and abandoned plans to bring out a paperback edition of his novel when its Japanese translator was stabbed to death in 1991. There have been protests against banning the book but more so against Khomeini's *fatwa*, which delivered the death sentence to a citizen of another country and without the due process of a proper trial. A collection of one

hundred works by Arab and Muslim writers, entitled *Pour Rushdie*, appeared in Paris in 1993, defending not necessarily the novel but the right of the author to free speech, and criticizing the inhuman and what some called the 'anti-Islamic character' of the *fatwa*.

However we must also mention the noteworthy signs of progress in the struggle for freedom of expression. The twentieth edition of the *Index Librorum Prohibitorum* – which appeared in 1948, and which had proscribed, among others: all works of Balzac, Stendhal and Emile Zola, the novel *Pamela* by Richardson, *the Prince* by Machiavelli, and *The History of the Decline and Fall of the Roman Empire* by Gibbon (but no works by Marx, Lenin and Freud) – was abolished in 1966. The following year saw the end of theatre censorship. And in 1984, Clive Ponting was acquitted from the charge of violating the Official Secrets Act.

In the United States, 'for a great part of the twentieth century the federal government policed many of the most revered American authors and playwrights and also watched well-known writers from other countries who are read and admired here'. The authorities might suspect American authors for a variety of reasons: the themes they chose for their books, their association with professional writers' groups or meetings, signing petitions, publications they subscribed to, and the places visited within the country and abroad. The FBI maintained dossiers on at least 150 such persons between 1911 and 1968. The list reads like a *Who's Who* of American literati. Some of the names are given below in, more or less, the chronological order in which files were opened on them: Ezra Pound, Walter Lippman, Jack London, Archibald MacLeish, Eugene O'Neill, John Reed, Robert Sherwood, Carl Sandburg, Sinclair Lewis, Edna St.Vincent Millay, Lewis Mumford, Upton Sinclair, Langston Hughes, Theodore Dreiser, Dorothy Parker, Edgar Snow, Erskine Caldwell, Howard Fast, Lillian Hellman, Thornton Wilder, Van Wycke Brooks, Ernest Hemingway, Irwin Shaw, Dale Carnegie, John Steinbeck, Lionel Trilling, Steven Vincent Benet, Moss Hart, Arthur Miller, Quenton Reynolds, William Faulkner, Jessica Mitford, John O'Hara, William Dean Howells, Ogden Nash, Grace Paley, Robert Frost, Erle Stanley Gardner, Robert Lowell, Anaïs Nin, Henry Miller, Richard Wright, Edmund Wilson, Tennessee Williams, Gore Vidal, T. S. Eliot, Norman Mailer, F. Scott Fitzgerald, e. e. cummings, Truman Capote, Allen Tate and Allen Ginsberg. The notebooks and manuscripts of Carl Sandburg were confiscated by the authorities in 1918, and, in 1959, they tried to prevent the 81-year-old poet from going to Russia as they considered such a visit 'extremely undesirable'. Howard Fast, Jessica Mitford and Grace Paley were unanimous in their belief that the activities of the FBI destroyed 'social writing' in America, which had been the hallmark of all great American authors right up to and immediately after the Second World War.

Others who attracted the authorities' dubious attention included British luminary and sculptor Henry Moore and the distinguished American publisher Alfred A. Knopf. The foreign authors that made the government uncomfortable included Thomas Mann, W. H. Auden, Stephen Spender, Graham Greene and Aldous Huxley. Bertolt Brecht, who was forced to flee Germany as we shall see later, left the United States (where he had lived six years) when he was required to testify before the House Un-American Activities Committee in 1948.

Works of Walt Whitman, Theodore Dreiser, William Faulkner, Upton Sinclair, James Cabal, Erskine Caldwell, Lillian Hellman, Edmund Wilson and John O'Hara have been subject to censure by United States authorities. Between 1917 and 1925, Cabal, Dreiser, Henry Miller, Schnitzler and, of course, D. H. Lawrence, won victories in their legal battles with the censors. *Ulysses* by James Joyce, which was once burned by customs officials, was allowed to be imported into United States in 1931. In the 1930s and 1940s, a host of authors including James Farrell, William Faulkner, Erskine Caldwell and James Cain faced the censor. Censorship trials of *Lady Chatterley's Lover, Fanny Hill, Tropic of Cancer* by Henry Miller, *Memories of Hecate Country* by Edmund Wilson, *Ten North Frederick* by John O'Hara, and *End as a Man*, a play by Calder Willingham, were important landmarks cases.

During the First World War, a law barred 'matter of a seditious, anarchistic, or treasonable character' from being handled by the United States Postal Service. Some considered that between 1917 and 1927, the Postmaster General was given more power in any other period of American history. The Second World War brought an Office of Censorship, whose main target was material of foreign origin that was 'inimical to the war effort of the United States or contrary to the interests of the United States or its Allies'. In the 1950s and 1960s many attempts on the part of the Postal Service to censor were thwarted or modified by court orders.

Between 1948 and 1961, against the backdrop of the Cold War, post-publication cases were brought against Communist Party leaders. Attempts by the authorities to suppress such publications as the *Pentagon Papers*, concerning the Vietnam War were defeated by the court. A greater victory came with the passage of the Freedom of Information Act (1966, 1974), which requires government officials to explain why some information should not be released.

Thanks to the efforts on the part of state and local censor boards and organized religious groups, combined with the film industry's own regulations, an entire generation of Americans grew up with the 'family film', characterized by some as 'an artistically immature, morally safe, and highly profitable entertainment'. During the Second World War, the film industry enjoyed the same privilege as the press and radio and was not subject to war censorship. The advent of television in the 1950s, which affected the film industry adversely, and the inclusion of films within the scope of the First Amendment, made films 'freer in the law and provocative in the content'.[15] But the post-war period was dominated by the Cold War, and the fear of communism was taken to new heights by the House Un-American Activities Committee (HUAC). Deciding to investigate communist influence in the film industry, it called 100 witnesses including many of Hollywood's most talented and popular figures to testify on their alleged communist connections or those of their associates. A group of eight screenwriters and two directors (Alvah Bessie, Herbert Biberman, Lester Cole, Edward Dmytryk, Ring Lardner Jr., John Howard Lawson, Albert Maltz, Samuel Ornitz, Adrian Scott and Dalton Trumbo) refused to answer questions and were sentenced to imprisonment. The members of the Motion Pictures Association immediately published the Waldorf Declaration, sacking the ten and expressing support for HUAC. Known as the 'Hollywood

Ten', these courageous individuals were blacklisted by the studios, and hundreds of others were fired from the industry. Throughout this era, filmmakers mostly produced conservative works, leading to a period of creative stagnation. The blacklist disappeared in the 1960s. In 1965, the court decided that prior censorship of films was unconstitutional, thus ending a long battle between the industry and the censors. The elimination of almost all censorial standards except obscenity, and the liberalization of the concept of obscenity itself, have completely altered the condition of filmmaking in the United States.

The rise of Nazism in Germany brought about a period of persecution of the arts and artists. The ideology of Nazi racism was fully applied to the field of culture, excluding from it all 'non-Aryan' elements and attacking what was called 'Negro culture' as a whole. Censorship of all forms of art, films and music was carried to the extreme. The works of Igor Stravinsky, the celebrated Russian-born composer who was then living in France, and those of Paul Hindemith, one of the leading German composers and musical theorists, were banned. Wilhelm Furtwängler – who conducted an orchestral version of what is considered Hindemith's greatest work, *Mathis der Maler*, with the Berlin Philharmonic in 1934, and supported the opera in the press – was barred from conducting it. As a result, Hindemith eventually left Germany for Turkey. Nazis threw a stink bomb into a Frankfurt theatre during the performance of Bertolt Brecht's *Mahagony*, and Kurt Weill, who directed Brecht's *Die Dreigroschenoper (Three Penny Opera)*, was also banned. For Brecht, whose books were burned and citizenship withdrawn, exile was the only viable alternative. The film version of Erich Maria Remarque's novel, *Im Western nichts Neues (All Quiet on the Western Front)* was banned for 'reasons of national prestige', and the novelist himself was also forced to flee Germany. The art works of Ernest Barlach, Wassily Kandinsky, Paul Klee and Lyonel Feininger were removed from an exhibition in 1930. Similarly Käthe Kollwitz's works were removed from two exhibitions in 1934 and 1936, and the police destroyed engraving plates of George Grosz, who fled to the United States in 1932. In 1934, the architect and educator Walter Gropius secretly sought exile in England, after the government closed down the famous Bauhaus school for architecture and applied arts, which he had founded in 1919. The frescoes executed in the Bauhaus by Oskar Schlemmer were ordered to be destroyed. Max Pechstein, painter and printmaker, was forced to resign his teaching position at the Berlin Academy when the Nazis declared his works 'decadent'. After Hitler came to power, modern art was virtually outlawed in Germany, and the function of art was reduced to the glorification of Nazism and the Führer. As a consequence of Nazi racism, studies of race and intelligence were outlawed in the German Democratic Republic.

Formal censorship was introduced in South Africa in 1937 to restrict attacks on Hitler and Mussolini in the foreign press. In doing so, the South African government hoped to eliminate 'anti-national' and 'un-national' members of the press and 'discipline' the radio service. Prior to 1950, censorship in South Africa served three related purposes: the continuation of the political economy of colonialism and its attendant social mores; the adoption of legislation designed to control the areas inhabited by blacks; and the repression of the trade union movement and communists.

After 1950, a series of new laws established an extensive censorship and self-censorship structure. South Africa carried on the policy of apartheid and denied all freedoms to the black majority. Under the Suppression of Communism Act of 1950, anybody suspected of non-compliance with the regime's policy could be prosecuted on various charges, including sedition. In the early years following the Second World War, when the judiciary was still independent, the acquittal of many accused of sedition greatly embarrassed the government. In retaliation, the parliament then removed certain cases involving sedition from the jurisdiction of the courts.

Between 1950 and 1990, thousands of books, newspapers and other publications were banned on the orders of the Ministry of Interior. This ban was later re-enforced by the Publications and Entertainments Act of 1963. The children's classic *Black Beauty* was seized by the customs authority, presumably because of its title. The Suppression of Communism Act, with its many subsequent amendments, and later, the Internal Security Act of 1982, authorized the government to ban organizations and individuals. Such organizations included the African National Congress, the Communist Party of South Africa and the Pan African Congress. Among the more than 2,000 individuals concerned by such legislation was Stephen Biko, banned for black activism in 1973, at the age of 17, arrested four times between 1975 and 1977 and jailed in Port Elizabeth. Biko eventually died of brain lesions in captivity in 1977. Even such brutalization could not undermine the fighting spirit of the black people. Their undisputed leader, Nelson Mandela, convicted of treason in 1964, suffered imprisonment for 28 years (1962–90). In 1994, Mandela was overwhelmingly elected as South Africa's first black president.

The Russian Revolution of 1917 established the world's first socialist state, the USSR. Within days of the revolution, censorship was put in place to control a hostile press. Intended as a temporary measure to be withdrawn after the restoration of normalcy, censorship was institutionalized in 1922 with the creation of the Central Censorship Office, empowered with final authority over printed matter and the performing arts. The Office, which became one of the most effective systems of censorship, endured until the demise of the communist regime in 1991. During Lenin's lifetime, a certain degree of tolerance was allowed in cultural matters, but no political dissent was tolerated. The early days of Stalin's rule were also less dogmatic in the cultural field. On the contrary, the theory of Socialist Realism, which required all creative people to serve the cause of the proletariat revolution, was adopted in 1934, but strong censorship was nevertheless enforced.

Soviet censorship required pre-publication supervision of manuscripts. The censor was guided by the infamous *Perechen*, a large volume listing all the types of information to be banned in the media. The aim was to ensure that no state secret was divulged and nothing against the communist ideology propagated. The censor did not directly prevent information from appearing; instead when he noticed something incompatible with the ideological directives, he made a recommendation to the editor who had submitted the text. Only the editor was allowed to modify the manuscript, but he invariably followed the censor's recommendation, for it was common knowledge that non-compliance would be reported to the relevant authorities of the Communist Party.

The Soviet system not only empowered the censor but also led to a great deal of self-censorship on the part of the authors themselves. Khrushchev sanctioned the suppression of Boris Pasternak's *Doctor Zhivago*, which was published in the West in 1957 (the novel was banned in the Soviet Union until 1980), and the author was prevented from accepting the Nobel Prize for literature awarded to him in 1958. Khrushchev did however allow the publication of *One Day in the Life of Ivan Denisovich* by Alexander Solzhenitsyn. But scores of other writers and artists were denied such freedom and reprimanded or persecuted. To escape the censor, a few authors, like Pasternak, arranged publication of their manuscripts abroad with the risk of its consequences. In certain cases, uncensored versions of works were circulated privately.

In order to stifle all opposition, the Romanian Government's denial of the freedom of expression took a curious form. By a 1963 decree, the government was authorized to decide who could possess a typewriter. The right to own a typewriter could be denied on grounds that a person had a police record or that his or her conduct posed a threat to public security. In collaboration with the local militia, the Ministry of Internal Affairs maintained records on the production, use and maintenance of typewriters, typewriter ribbons, duplicators, ink and other materials for the reproduction of printed matter. Even the repainting of typewriters could only be carried out in specific workshops.

In 1989, Israel, which has a rigid censorship system, banned the use of fax machines in the Gaza strip, confiscated all such machines found in the possession of journalists and made buying or operating a fax machine subject to obtaining a special license. The Israeli State bans anything that fosters Palestinian nationalism or extols Palestinians' history. In 1986, a Palestinian book exhibition was raided, some of its organizers arrested and a thousand titles confiscated. Thousands of books are banned in Israeli-occupied territories. Journalists are placed under severe restrictions in Israel – from controlling their access to the West Bank and the Gaza strip to placing them under house or town arrests – while authors who do not conform to the government line are often held, with or without trial.

Following the revolution in 1949, China took the same path as the Soviet Union in the early years after its revolution. The address that Mao Zedong delivered in Yemen in 1941 was considered a manifesto for writers and artists. The principle dictated that the creative individual should come closer to the people and reflect their revolutionary spirit in his works. In order to achieve this, he was required to abide by the dictates of the Communist Party. Strict censorship imposed in the 1950s was somewhat relaxed in the early 1960s, but that was more than offset by the Cultural Revolution, which lasted from 1966 to 1976. At that time, the cultural system in China was seen as elitist and tending towards 'bourgeois values', and Mao sought to correct the situation. His wife, Jing Qing, who was later decried as the leading figure of 'the Gang of Four', was anti-intellectual by conviction but gathered a band of radical intellectuals to implement the new cultural policy. According to an official statement, 'They totally negated the cultural accomplishments achieved under the guidance of socialist cultural policies in the seventeen years since the founding of the People's Republic, ruthlessly attacked and persecuted literary and artistic workers, banned the splendid Chinese and foreign cultures, both ancient and modern'. Many intellectuals were verbally abused and physically attacked by the Red Guards – the urban groups who enforce the principles of the revolution – and were subjected to forced labour, imprisonment and, in some cases, abusive treatment leading to death. Among those persecuted were the historian Wu Han, deputy mayor of Beijing, and esteemed creators like Peng Zhen, Lu Dingyi and Zhou Yang.

The end of the Cultural Revolution brought the return to the old policy of 'serving the people and socialism'. This implied serving 'all those who support socialism', 'eulogizing communist ideas and moral values', bringing up a new generation of socialist-minded young people and raising society's ideological, cultural and moral levels'.[16] The special role of literature and the arts in achieving these goals is acknowledged, and there are signs of some relaxation of the rigid cultural atmosphere.

In British India, the press was never free, and only the extent of the restrictions varied from time to time. The First World War coincided with a growing national aspiration in India and the intensified activities of the Indian revolutionaries in Germany and the United States. The government, already armed with the Press Act of 1910, was accorded more powers under the Defence of India Act of 1914, which imposed rigid censorship. The press was expected to contribute to ensuring state security. Thus approximately 10 per cent of Indian newspapers and printing presses were under fiscal control. Journalists were harassed, muzzled or imprisoned, and the government established a Central Publicity Bureau to inform the public of events at home and abroad. During the war years, over a thousand titles were banned.

As the political movement for freedom gathered momentum after the end of the war, the government applied the numerous acts available in its legislative arsenal, but shortly afterwards some concession to public opinion were deemed necessary. In 1922, the Press Act of 1910 and the Newspapers (Incitement to Offences) Act of 1908 were repealed.

With the launching of the Civil Disobedience Movement, the government sought a greater degree of authority to suppress the press through the Indian Press (Emergency Powers) Act of 1931 and the Foreign Relations Bill of 1932, both of which were widely used. Between March and June, 'the British had issued formal warnings to 150 publishers and banned approximately 400 books and tracts, 40 posters and 50 newspapers.' Nationalist writings were prosecuted, with their authors often jailed. The Indian newsmen founded the Free Press of India, an independent news agency, while clandestine presses operated and 'potentially dangerous writings' widely circulated.

The Second World War years marked a step backward in India's struggle for freedom of expression. Expanded censorship was imposed in 1942 and continued until 1945; many newspapers and periodicals suspended publication, and the number of banned books had swelled. Indian and Pakistan had inherited the legal and administrative system left by the British. Although India maintained stringent press laws related to national or state security, sedition, obscenity, heresy or blasphemy, the judiciary and the press associations have successfully countered these attempts to enforce censorship.

In Pakistan, power over the press and other published material was further strengthened by the Public Safety Act

of 1949, the Security Act of 1953 and the Defence of Pakistan Rules of 1965. 'In a continuing atmosphere of political turmoil newspapers were censored, forced out of business and brought under stringent security provisions'. Following the adoption of Pakistan's first constitution in 1956, the situation appeared to have improved, but frequent imposition of martial law led to further restrictions on the freedom of expression. The gradual Islamization of the country since the 1970s fostered more severe restrictions either by amending the old laws or introducing new ones like the far-reaching Blasphemy Law. In a bid to control the freedom of expression, the authorities have burned books, subjected journalists to physical punishment and authors to harassment and arrests.

Periodic long-time military rule in Bangladesh has interfered with the freedom of expression in general, but an attempt by conservative voters and legislators to pass a Blasphemy Law similar to the one in Pakistan has failed.

The history of censorship and the struggle for freedom of expression in the twentieth century has been marked by triumphs and setbacks. As we begin the twenty-first century we hope that it will portend a freer world for humanity.

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# 25.7
## HIGH CULTURE AND POPULAR CULTURE

*Theotônio dos Santos*

The notion of 'high or learned' culture resulted from the growing individualization of the cultural producer during the European Renaissance. The cultural producer (craftsworker, scholar, member of a religious order, etc.) generally belonged to the community and seldom acted as a separate, independent agent. During the sixteenth and seventeenth centuries, the development of the royal courts and the rise of a bourgeoisie enriched by the expansion of world trade paved the way for the emergence of painters, sculptors, singers, musicians, actors, playwrights, poets and writers, who became major individual figures recognized and lionized by their patrons or customers (the monarchical state, churches and convents, wealthy individuals, etc.). This increasingly professional activity gave rise to unique and inimitable works of art as part of a well-defined cultural world.

In the eighteenth and nineteenth centuries, that cultural world was marked by the baroque and classical styles, interpreted by many creative geniuses who laid the foundations of Western art and culture. Polyphonic music, the theatre, opera, dance, painting and sculpture (as disciplines independent of architecture), poetry and novel writing, in addition to the development of science, which influenced these autonomous forms of cultural expression – all this gave rise to a cultural heritage in the West that was distinct from the cultural production of the past, and was presented as 'high culture', deeply rooted in what was termed Greco-Roman antiquity.

Access to high art required specific training and learning through schools, universities, academies and conservatories. Appreciation of that cultural output required a process of initiation, since it was produced and consumed in these specially designated contexts. This was the world of the Enlightenment: a philosophical, scientific, moral and aesthetic cultural model that was to conquer the whole of humanity, since it was a product of pure reason and of the match between the social order and the requirements of human nature. Such, at least, was the European vision from the eighteenth century until the Second World War.

### TRADITIONAL AND POPULAR CULTURE

High culture developed partly in contrast to a traditional rural or popular culture, and to the cultural and religious rites that took on special importance in Europe during the Middle Ages. But that period also saw the development of a new and distinctive urban culture that was no longer based on folklore, which tends to rely on collective, non-evolving and non-professional work.

Popular culture sprang from a number of innovations: the advent of the press and printing; the generalized use of ink and canvas; the progress of acoustics and musical instruments; the building of places for public entertainment and new techniques of communication. This new culture also developed from the formation of bourgeois tastes and of an increasingly complex and differentiated civil society which, in several revolutionary waves, took possession of the gardens and parks of the nobility and the monarchy to establish its own cultural world in which entertainment, emotion and sensuality had a much more prominent role than in the rationalistic 'high culture' of the Enlightenment.

The new bourgeois world often sought its roots in the tradition of ethnic groups, which seemed more adept at developing lively arts, such as gypsy music that inspired the songs of Central Europe and Russia and the Spanish flamenco (just as it inspired the learned musicians of the romantic and nationalist schools), the songs of southern Italy or the Viennese waltz, which originated as popular expressions before reaching the salons and the public stage. In America, the rich cultural tradition of African slaves gave rise to Negro spirituals and jazz, whose subsequent development often mingled with learned music. It is curious that this artistic world, which includes lyrics from both popular and learned sources, often became involved in the theatre, imitating the opera and ballet of the courts, and subsequently of the national theatres, with lighter versions such as vaudeville, the *zarzuelas*, North American musicals and several other similar forms of expression such as the Japanese kabuki theatre (Plate 129), which popularized the classical theatrical discipline of the Noh theatre or even Beijing opera.

The bohemian world was also the setting for much aesthetic production that broke with classical high culture while not forsaking its elitist credo of 'art for art's sake', that is, the pure, autonomous and independent artistic work. Movements such as impressionism, art nouveau, expressionism, futurism and other schools of abstraction, dada and surrealism did not break completely with high culture, despite their search for broader and more accessible

techniques that dispensed with the classical form and content and the romanticism and realism of the nineteenth century.

Without breaking with classic techniques and forms of representation, they sought new artistic and aesthetic content closer to the common people (understood as the European peasant, the American Indian or the Japanese peasant, all idealized as the source of human purity and spontaneity destroyed by civilization) or even, in the case of the socialist states, of the modern working class.

## THE INTERACTION OF HIGH CULTURE WITH POPULAR CULTURE

As the state cultivated high culture – particularly through its system of education from the primary to the university level, the religious schools and ideological associations, museums, art galleries and national theatres – the new structure of popular culture was gaining unprecedented momentum. It entered the brothels, the popular theatres, the newspapers and the popular publishing houses that were increasingly catering for a non-official readership. Among the new potential audiences were women, who, being denied access to high culture (since they were debarred from formal education, above all secondary and university), found instruction in novels, newspaper serials and women's magazines covering fashion and other pastimes.

The strongest impact was made by the advent of new techniques such as linotype typography (Plate 130), photography, radio and cinema and television. At the same time, industrial objects were influenced by new aesthetic principles unrelated to the classical style. This far-reaching revolution eventually affected high culture itself. Under the pressure of the social conflicts of the late nineteenth and early twentieth centuries, high culture was evolving, with notable changes in the means of aesthetic production. The introduction of aesthetic considerations in mass production and the capability of reproducing works of art for a much broader public led to dramatic possibilities for art. The Russian Revolution and the revolutionary wave following the First World War produced a rigorous quest to exploit mass production for art's sake. The Russian avant-garde and subsequently the Bauhaus school (which offered a refuge for some of those who were discontent with the direction the Russian Revolution was taking) attempted to change the concept of art by subordinating it to functionality.

The art object was becoming transformed into work of intrinsic value increasingly integrated into the industrial revolution. It was the period of the advance of the scientific management of production, referred to as Taylorism or Fordism: mass production based on the division of labour executed by machines and by workers. It was a time of increased productivity through the full development of mechanics and of electric and fossil-fuel energy. Artistic production had to take into account the new materials, mechanization, mathematics and engineering. Art had to be reintegrated into daily life. A break was needed with the traditional theatre scene, with museums and with any notion of a performance, in order to take art to the streets. A break was needed with the opposition between high culture and popular culture, the latter being turned into an applied expression of the former.

But the result was not initially encouraging. The aesthetic revolution of the Russian avant-garde did not win support among the masses and was easily crushed by the Stalinist state. It must be remembered, however, that the USSR was predominantly a country of peasants and that it was very difficult for the rural population moving to the urban centres to identify with the modern proposals that portrayed an abstract and mechanical industrial world devoid of sensitivity. The same oppression and suppression occurred in Nazi Germany with the Bauhaus movement. In addition, no governments were ready to accept the anarchist content of the programme of the surrealist artists. It is interesting to note, however, that the Mexican Revolution remained faithful to its artists. Mexico's mural artists, nationalist musicians, 'magical-realist' writers and even surrealist production were maintained and supported by the revolutionary state. Of course, after the Second World War, Mexico was unable to resist the pressures of the industrial culture of the United States.

From the Second World War onwards, the apparatus of learned culture came into stiff competition with the nascent cultural industry. The cinema, photography, radio and television were new activities based on mass production. The cinema developed its own aesthetics, which conferred upon it the status of art (the so-called seventh art). Photography also received significant aesthetic recognition. Radio and television never achieved a similar status but attracted novelists, playwrights, film directors, and several other categories of professionals who flirted with high art. The novel and the theatre ultimately incorporated substantial aesthetic aspects of the cinema and mass media. Pure scientists also approached these mass media. In some cases, such as the British Broadcasting Corporation (BBC), major documentary schools were born.

Alongside the new communication media, typography was advancing very rapidly, with offset techniques, and opening up opportunities for publications. Then came the famous comic magazines with a new type of illustrated literature. Mass-reproduced drawing became highly sophisticated under the influence of expressionism and other aesthetic trends. Comics began as literature for young people but then progressed to an adult readership. The Japanese mangas offer an example of this changing pattern, which had substantial precedents in the nineteenth century. Comics were later to influence pop art of the 1960s and 1970s.

Popular music developed immensely in the period, relying on full orchestras and giving rise to jazz and the 'big band' sound. Jazz had a very strong influence on traditional music in the 1920s and 1930s. Gershwin (Plate 131) and Cole Porter brought jazz to the stage with highly acclaimed musicals. The progress of the new electronic instruments cleared the way for more technically complex shows in the 1960s. The Beatles emerged from working-class areas and raised rock and roll (originally regarded as a white version of jazz) to new heights. The great rock concerts were part and parcel of the movements contesting the Vietnam War or defending other causes and drew audiences in the hundreds of thousands. This new young public danced, demonstrated politically and, above all, indulged openly in new behaviour generally prohibited in other circumstances, particularly drug-taking. The way was open for youth gangs associated with different versions of rock, rap and other expressions of a new social and cultural phenomenon, as a by-product of unemployment and social exclusion, while at the same time

reflecting the development of technology and more leisure time in a demographic structure where young people achieved a pre-eminence.

The appropriation of this cultural dynamism by the communication media has sometimes been hesitant but, by and large, they sought to exploit these phenomena. The world of the young and of rock music influenced the language of the audiovisual systems. The rapid cut, the unfinished sentences, a specific vocabulary and the crude jokes gave rise to the clips that take up more and more television time, particularly on programmes conceived for young people. There is growing perplexity in the fields of aesthetic, social and political thinking in the face of these changes. Many believe there to be a growing opposition between the various elements of this technological revolution: high culture is said to be threatened by the cultural industry; reading is reportedly threatened by the audiovisual media, and the cinema is seen as facing extinction because of television and videos. The latter in turn are threatened by multimedia, and so on. There should be some scrutiny of these attempts to theorize about such phenomena. It is regrettable to note, however, that they often reflect more the authors' prejudices than any in-depth study of humanity's cultural evolution or revolution.

## THEORIES ON HIGH CULTURE AND POPULAR CULTURE

While the Enlightenment was certain about the superiority of its cultural programme, Romanticism expressed doubts when insisting on the thematic presence of the universe of the peasants, indigenous inhabitants and others. However, the point was to incorporate these other realities as ingredients of modernity. The clashes of the late nineteenth century were already revealing alternative social movements. The workers were pressing for a new economic, political and cultural order. During the Russian Revolution, the cultural proletariat postulated the superiority of proletarian culture, but saw themselves as the beneficiaries of high culture, insisting that it be opened up to the world of industrial production. The Bauhaus also called for the triumph of the useful and the functional created by mass production, but was bent on reforming high culture. Marxist authors like Walter Benjamin attempted a synthesis between high culture and the nascent urban popular culture. Bertolt Brecht attempted such a synthesis in the theatre. But the Nazis seemed to have won this battle by turning the masses themselves into a spectacle, giving them a group identity and dictatorial political power without any clear limits. Brecht sought to educate the masses through the performing arts, while the Nazis succeeded in mobilizing them by the same means. On the other hand, authors like Gabriel Tarde in the late nineteenth century, and Ortega y Gasset in the 1920s and 1930s, regarded the emergence of the masses as a threat to high culture and to human values in general. They feared the totalitarian force that derived from the political exploitation of the masses.

Adorno and Horkheimer were perhaps the first to identify the new popular mass culture as a culture industry. This was not just an expression of the temperamental behaviour of the masses, but reflected a manipulation that was both political and a blueprint for civilization, a totalitarian threat out to banish the rationalist modernity

that high culture signified. The defence of reason, even though critical reason could question its elevation to an absolute by the Enlightenment, was the defence of civilization against the totalitarian threat of Nazism, Stalinist bureaucracy and, subsequently, of the culture industry dominated by the capitalist production system. The critique of Adorno and Horkheimer did not seek to understand the dialectic offered by this culture industry, but they saw it as an expression of capitalist mercantilism or totalitarianism. They spoke out for a proper defence of high culture – despite its class content – insofar as it allowed the progress of human thought independent of the objectives purely geared to mercantilism, entertainment, utilitarianism and the manipulation of emotions and feelings of mass culture converted into an industry. And while their criticism was really directed against the Enlightenment itself (which they sought to transcend in a positive version), the readers of their essay on the culture industry tended to completely negate the culture industry, which they considered to be a monster spawning alienation. The notion developed by Althusser, many years later, of the state ideological apparatus bolstered this approach by adding to it a structuralist methodology viewing capitalism as a self-sustaining system whose components were always functional in terms of its self-reproduction. Both mass culture and bourgeois high culture were viewed as instrumental in constituting the system and reproducing it. Marcuse accounted for this discourse by perceiving modern capitalism as a one-dimensional system. There was no longer any internal contradiction between the components of the system, and it could only be negated by external factors. The dialectic no longer existed, and Marxism became just one more modality of non-dialectical formalist thought. Many studies of the 1960s and 1970s embraced this approach.

Without completely breaking with these methodological problems, we must highlight another line of criticism represented by the studies on the domination exerted by the major economic groups and the imperialist states over the communication media. Authors such as Herbert I. Schiller, Armand Mattelart and Ariel Dorfman applied the dependence theory of international domination to the field of culture. In the 1970s, this line of thought reached UNESCO and gave rise to the proposed New World Information Order. The aim in fact was to transform into a real process the historical reaffirmation of the peoples subjugated by the expansion of European capitalism from the sixteenth century up to the Second World War. The point was to show that the world system (which centred on European countries and subsequently the United States) had given rise to a cultural Eurocentrism that took characteristics intrinsic to European societies and cultures and to the process of primitive accumulation of capitalist expansion and identified them more generally with civilization, modernity and humanity. Among these idiosyncratic European elements was the racial superiority of the white peoples. European racism was the outcome of the triumph of white peoples over other peoples, but in particular, starting in the nineteenth century, the triumph of the Anglo-Saxon peoples who claimed to be identifiable by racial characteristics. This even entailed discriminating against the whites who had previously been hegemonic but were now decadent (perhaps on account of mixing with the African peoples). Slaves were also excluded, since their enslaved past ruled them out of Western civilization.

The criticism of Eurocentrism and its view of modernity launched by the emerging peoples is compounded by the complaints of the feminist movement, which revealed certain ethical and aesthetic values and the dominant and hegemonic position of the patriarchal system consolidated in the West since Greco-Roman times. High culture thus saw itself under attack from various flanks. While it was previously branded as elitist and disdainful of the world of the working class and the poor in general, its Eurocentric, racist and sexist content was now also decried. But mass culture and the culture industry were of no avail in overcoming those ills questioned by the development of new social forces originating in the late nineteenth century. The efforts to develop a counter-culture, an alternative or underground culture, in the 1960s and 1970s, or even a New World Information Order, ended in the 1980s with the absorption of its myths and proposals by the Establishment's culture industry or its forceful replacement by a process of cultural globalization dominated by the major economic groups.

This prompted an enormous strengthening of the structuralist and pessimistic approach through such authors as Derrida and Foucault, who led the way to the idea of a post-modernity in which the cultural forms are dissolved in a flow of never-ending changes. In this new context, high culture and mass or popular culture and the culture industry all merge into an indeterminate dynamic process. In this pessimistic context, UNESCO's *Report of the World Commission on Culture and Development* is of great use in that it has sought to redefine the role of culture, high or low, in a globalizing world where pluralism, creativity and the support for social movements and for women, children, young people and other minorities can thrive through the defence of the cultural heritage of humanity, environmental protection, and cultural policies in tune with the changes of our time.

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# 25.8

## CULTURE, NATIONAL CULTURES, CROSS-CULTURALIZATION, ACCULTURATION AND INCULTURATION

*Henri Madelin*

### INTRODUCTION

According to the American anthropologist A. L. Kroeber, 'the most significant accomplishment of anthropology in the first half of the twentieth century has been the extension and clarification of the concept of culture'.[1] This terse statement seems pertinent as far as the notion of *extension* is concerned, but much more debatable as regards *clarification*. The concept of culture made great strides in the last century, encompassed numerous fields and became ensconced at the heart of several disciplines in the social sciences. But the gains in extension were often made at the expense of clarification. By overusing the concept of culture, scholars became somewhat lost in the construction of a sort of colourful mosaic that misinterprets this complex reality to such an extent that there has been a growing scepticism towards what specialists tell us about 'culture'.

Our aim in this chapter is therefore to attempt to bring some order into the area generally called 'culture' and to make a number of necessary distinctions enabling us to refine our understanding of it in the context of our times. As the philosopher Jacques Maritain liked to say, it is important to be able to 'make distinctions in order to unite', to decompose in order to reassemble. The firmament of culture has been shattered and lies scattered in a thousand pieces. The task is to find these pieces and bring them together in order to reconstruct a new fountain of light once more able to play in the sunlight of understanding. We shall thus address what should be understood by the terms *culture, cultures, national cultures, enculturation, cross-culturalization, acculturation* and *enculturation*.

### CULTURE: THE PORTAL OF HUMANIZATION

To begin with the simplest notion, we may say that a human being can truly accede to humanity only through *culture*, that is, by putting nature's resources or wealth to good use. During the Neolithic period, technology made it possible to transform the soil and cultivate it so as to make it propitious for those capable of nourishing themselves from the fruits of the earth. This is the meaning of the word *agriculture*.

In the words of Vatican II:

> The word *culture* in its general sense indicates everything whereby man develops and perfects his many bodily and spiritual qualities; he strives by his knowledge and his labour to bring the world itself under his control. He renders social life more human, both in the family and the community, through improvement of customs and institutions. Throughout the course of time, he expresses, communicates and conserves in his works great spiritual experiences and desires so that they might be of advantage to the progress of many, even of the whole human family.[2]

Those who wrote these words for Vatican II were not content merely to enumerate the meanings of the word *culture* in the life of each individual and in the origin of human societies. They noted that the word often has a sociological and even ethnological meaning that makes it possible to speak of a *plurality of cultures*. It is like a ladder that enables us to pass from the level of the individual to the collective level, and from cultures in the plural to a national culture, rising to the concept of a universal human heritage.

> Different styles of life and multiple scales of values arise from the diverse manner of using things, of labouring, of expressing oneself, of practising religion, of forming customs, of establishing laws and legal institutions, of cultivating the sciences, the arts and beauty. Thus the customs handed down form the distinctive heritage of each human community. It is also in this way that there is formed the definite, the historical milieu which enfolds people of every nation and age and from which they draw the values that permit them to promote civilization.[3]

In all periods, lifestyles, value systems, legal codes, legislation, work, science and technology, religion, art and aesthetics form a cultural fabric. This can be seen in fundamental

expressions, ethnic traditions and national customs. Our own age is even witnessing the dawning of new aspirations to rise to wholeness and to the search for a global civilization encompassing all humanity.

## NATIONAL CULTURES AND CROSS-CULTURALIZATION

The conclusion established by Max Weber in the wake of the First World War remains valid: national culture takes shape under the pressure of violence. The modern state in fact appropriates legitimate and legitimized violence for its own benefit, removing it from the intermediate groups, clans and social classes that had historically made use of it. If there existed only social structures from which all violence had vanished, the concept of the state would have disappeared and nothing would remain but 'anarchy' in the literal sense. There is an intimate relationship between the state and violence, and its manifestations can be seen all over the world, all the more so as a dark and centralized nationalism is taking shape at the internal level and is aggressively seeking to spread to other nations.

'Today', Max Weber explains, 'we have to say that a state is a human community that (successfully) claims the monopoly of the legitimate use of physical force within a given territory. Note that "territory" is one of the characteristics of the state'.[4] The national state is not completely encapsulated in the privileged use of violence, but rather resorts to it in decisive moments as a 'specific means'. The more a country's cultural nationalism attempts to be powerful, the more the politicization of the country becomes necessary.

In order to exist in space and time, a national culture needs an administrative tool, which requires financial resources, a specialized body of civil servants of all ranks, and a bureaucracy at all levels. For a national culture to bear fruit, people with different views, organized opposition groups, and specific ways of dealing with the minorities scattered throughout the country and abroad have to be allowed to mingle. This implies a long-term effort concerning the myths that make up a collective history, the management of a system of symbols, openness towards a liberated world of the imagination, and help from an ideology that affirms individual identity.[5]

Behind the collective screen, however, the rise of individualism among ordinary citizens and within groups is being noted everywhere. It is promoting the advent and intermixing of cross-cultural networks. It may promote the emergence of counter-cultures that disagree or conflict with the official tone or aggressive character of the national culture. This can be seen in all parts of the world. A person is no longer identified with a single nation, a single system or a single culture. British political scientist Derek Urwin has rightly noted that in every individual, even if he or she is a migrant, there exist two conflicting rights: the 'right to roots' and the 'right to choose'. Rootedness constitutes the essence of identity since it helps us to answer these crucial questions: Who am I? What am I? Where am I? But other questions also arise: What will I become? How can I progress? The right to choose and change is just as important since every person may wish not to remain enclosed within a community that would limit his or her horizons. Individual or fragmentary cultures can therefore call into question the

symbolic order of a nation, come to arrangements with state institutions, bring pressure to bear on the leaders of countries, and exert an appeal by offering new concepts to the imagination.

Likewise, no nation can now remain fixed in the culture that it inherited. Education, travel and the new means of communication cultivate a critical outlook and circumvent the repetitive aspects of a national culture. The national state, as Daniel Bell has stressed, is too large to spot and assess the networks that are spreading at the micro-cultural level, and too weak to counter the pressure of the macro-cultural forces now capable of crossing borders. Languages, different forms of music, films, trade, television and radio programmes, the weaving of new relationships across the Internet, groupings with a religious basis, and various other pairings are joining forces to encourage a process of cross-culturalization. This combines contributions from neighbours and from the world at large. The national culture is expanding, changing its priorities in its system of values, and absorbing new contributions that one day will be the foundations of reconciliations, alliances and agreements between nations that were once enemies. Interest is suddenly growing in searching for long-ignored treasures beyond national borders. Thus the title of a book written by the Senegalese wise man, Hamidou Khane, is justified: *Comme si nous nous étions donné rendez-vous* (As If We Had Arranged to Meet). Cross-culturalization has come of age.

## THE SYMBOLIC, THE UNCONSCIOUS AND ENCULTURATION

Ethnologists tend to focus on past cultures. They decipher texts and monuments and artistic work that preceded present-day cultures. By contrast, anthropologists observe the present. They seek to grasp how people live in the here and now, understand each other and express themselves, and give significance to their own lives and the lives of others. This is why the over-emphasized distinctions between the culture of 'elites' and 'popular' culture ignore the cultural background that, from the beginning, nurtures all members of a society. Likewise, the separation between 'primitive' art and 'modern' art is unfortunate. A true work of art is valuable in its own right, regardless of the period that produced it.

Unlike science, which is linked to progress, art is independent. Thus works of art are free and innovative creations, produced under the circumstances made possible by the techniques of its time. As Max Weber stated, 'A work of art which is genuine "fulfilment" is never surpassed; it will never be antiquated.'[6]

The American anthropologist Clifford Geertz has had a profound influence on the definition of the culture of a given society. Geertz lays stress on the role of the symbolic as the key to the cognitive dimension. He believes that culture is 'a historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and attitudes towards life'.[7]

However, we must avoid exaggerating the cognitive dimension. Symbols contribute to informing and structuring human beings in a given society, but the role of values remains vital in order to provide goals for what is undertaken

and to enable weighty decisions to be made. The absorption of values by every individual involves a hidden aspect, in which the unconscious does as much work as the conscious mind. This is brought to the fore by the concept of *enculturation*. It is through enculturation that an individual becomes a cultural being with well-defined features and follows processes that continually unfold in time. From birth, individuals enter into possession of, internalize and develop those aspects of the culture that integrate them into society: habits, values, reflexes, means of expression, and norms. Enculturation is therefore a sort of long-drawn-out and effective impregnation. It endows human beings, over the years, with a wide variety of models that orient their lives in a specific direction while excluding other potential orientations. It is a conscious and unconscious process that invades an entire existence and subtly but profoundly affects it. To begin with, it presupposes slow periods of learning and initiation in the family setting and the social and school environment. Everyone adopts a cultural language and swims in a culture like a fish in water. Passivity is complemented by activity, and things given are complemented by things acquired. In any event, it is not until we are exposed to other cultural experiences that we become more conscious of our own enculturation.

## TOTAL OR SELECTIVE ACCULTURATION

When a culture evolves and changes through contact with another culture, we speak of *acculturation*. In the contemporary world, few societies live in a state of cultural self-sufficiency. Acculturation frequently takes on an aggressive quality since it is often a one-way process, from dominant to dominated societies subjected to this excessively one-sided kind of invasion. We speak of *deculturalization* when the long-term violence exercised by the most powerful destroys the culture of the weakest. After the uprooting of those who suffer this prolonged pressure, collective death may occur (cultural genocide or systematic ethnocide). To counter such destructive processes there are projects for *reculturalization* or for *counter-acculturation* that seek to re-establish the cultural identity of a group threatened by an outside cultural force. These phenomena of acculturation and the reactions they provoke are now occurring through expanding worldwide communication as exemplified by television and radio, intrusive music, dominant languages, fascination with the Internet, advertisements, the exporting of technologies that deceive by wearing a mask of neutrality, the stimuli of new and outrageous forms of consumption and ostentatious lifestyles, the development of global tourism, wars, etc.

A number of variables generally temper the one-way processes of acculturation. According to sociologists, the magnitude of cultural changes should be gauged with reference to the groups in contact with each other. It is also necessary to observe the circumstances of the contacts, depending on whether they are the result of an ideological impregnation (the limited sovereignty of the socialist countries in the time of the USSR); colonialism, with the occupation of places and territories (Maghreb, Rhodesia); tribal or international war; or migrations of workers. Actions and reactions vary according to the size and relative importance of the cultures under consideration, the type of urbanization and rural society, and the demographic importance and size of the territory occupied by the groups in conflict. Despite muted opposition between indigenous and conquering cultures, a process of selection and partial acceptance of imported traits generally occurs. The clash between cultures can, however, lead to a reorganization of the borrowing culture and a reinterpretation of the things that are accepted.[8]

## RELIGIOUSLY BASED ENCULTURATION

According to the definition given by J. Scheuer, *enculturation* 'is the process by which the Christian life and message become established within a cultural community or a given society, and become so well rooted that they produce new treasures, new forms of thought, action and celebration'.[9] Inculturation aims to naturalize the Church in each country or social sector, with due regard for the inherent character of each collective entity. This may be a region, an ethnic group, or a social group.

The term was coined in the theological context of the Catholic Church at the time of Vatican II. By its root *culture*, the word *enculturation* lays stress on the consistency of cultures and may appeal to recent findings in anthropology. By its prefix *in*, the word spontaneously evokes the mystery of 'the Word made flesh' referred to in the Prologue to the Gospel according to Saint John. The term was coined recently in order to describe the worldwide expansion of the Church in a way that showed regard for the cultures being approached. It allows a reinterpretation of the shortcomings noted in past actions, so as to inaugurate a new way of relating to the variety of cultures filling the earth. It is reinterpreted today as a key for understanding the history of Catholicism and its missionary expansion from the West. It opens up new prospects for the future dialogue between different cultures, especially those in Asia and Africa. Pope John Paul II spoke in new terms of the clash of present-day cultures on the religious level in an encyclical letter, *Fides et Ratio*, published on 15 October 1998, which inspired this paper.[10]

A cultural tradition cannot seek to preserve its distinct identity by withdrawing from any contact with others. It would be contrary to the very nature of the human spirit to believe that one is able to grow by opposing other traditions. To speak of faith and reason thus leads to the connection between cultures and faith and to what is at stake in the contact between different cultures. The lesson is valid for Europe as well.

No future is possible if every culture withdraws into splendid isolation. Preaching the faith, for its part, can only wither if it arrogantly ignores the 'reality' of the soil in which it is planted.

It is important not to view too pessimistically the globalization of the world that is a feature of our times and is now influencing cultures and religions. The *transversality*, or communication by osmosis, of cultural, religious, poetic, philosophical and theological values does not inevitably lead to an intolerable uniformity. What is taking place in these spheres rather contradicts the similar features to be found in the global expansion of science and technology. In fact, one option always remains open in the universal confrontation of cultures, and that is the possibility of understanding each other through our respective differences.

Herein is revealed the identical nature of the human condition and the unity of that condition when faced by the same demands that life makes, namely, for food, shelter, communication, reproduction, suffering, prayer, and courageously pursuing a life that is always uncertain yet exciting. It is by being rooted in the riches of their cultures that human beings discover what they share, and how they respond to this universal demand in such varied ways.

## NOTES

1.   A. L. Kroeber, 'Anthropology', *Scientific American*, Vol. 183 (September 1950), p. 87.
2.   *Vatican II: Gaudium et Spes: Pastoral Constitution on the Church in the Modern World*, Chapter 2, No. 53, para. 2, 1965.
3.   Ibid., para. 3.
4.   M. Weber, 'Politics as a Vocation', in H. H. Gerth and C. Wright Mills (eds), *From Max Weber: Essays in Sociology* (New York, 1958), p. 78.
5.   Y. Schemeil, 'Les cultures politiques', in M. Grawitz and J. Leca (eds), *Traité de science politique Volume 3: L'action politique*, (Presses Universitaires de France, 1985), Chapter 4, pp. 237–67.
6.   M. Weber, op. cit., p. 138.
7.   C. Geertz, *The Interpretation of Cultures* (New York, 1973), p. 89.
8.   A. Akoun and P. Ansart (eds), *Dictionnaire de sociologie*, Le Robert, Seuil, 1999, pp. 2–3, 590.
9.   J. Scheuer, 'L'inculturation, présentation du thème', *Lumen Vitae*, Vol. 39, 1984, p. 253.
10.   Encyclical letter *Faith and Reason*. Libreria Editrice Vaticana.

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# 26

## LITERARY AND ARTISTIC CULTURE

## 26.1
### LITERATURE

*Marc Bensimon* and *Astrid Guillaume*

While setting out the main trends in world literature from 1914 to 1999, this chapter cannot claim to cover every literary movement, author, language or country, and all of their distinctive features. Space constraints have ruled out a comprehensive account of every great writer and the predominant themes in every nation. Any attempt to do so would result in nothing more than a long list or a catalogue of sorts. Moreover, there will inevitably be omissions but these should not be interpreted as a form of censorship. Rather we hope to demonstrate that, despite the diversity and profusion of literary forms, the literatures of all five continents share several fundamental aspirations.

### INTRODUCTION

Recent discoveries by scientists concerning the atom led them to speculate about the nature of human beings comprising such atoms and in constant evolution. Human consciousness is ever-changing and, within its limited perspective, is constantly seeking to improve its perception of itself.

Literature never ceases in its task of recording humanity's endless questioning of its traditional self-image. It has reflected on human beings' relations to themselves, one another, and the world at large, and has speculated on one of humanity's chief means of expression: literature. Never has this been more true than in the twentieth century.

In the nineteenth century, literature, like the other humanities, sought to fix certain human beings in a particular history and chronology; a national heritage would be claimed, in the form of an idealized and deeply cherished past. By contrast, twentieth-century literature looked rather to synchronism and common space. Similar aspirations simultaneously expressed in different countries caused traditional borders to dissolve. In addition, relations were explored between various forms of art, and the outlook became international. Even writing spawned by particular revolutionary, national or regional causes (on behalf of a given struggle waged against colonialism, racialism or some other form of oppression) could only hope to last and emerge

as work of significance by encompassing humanity: that is, by being relevant to all the inhabitants of the planet.

Early twentieth-century writers felt impelled to probe beyond traditional limits in order to discover and explore both the self and its surrounding world. Links with the past were deliberately cut in order to find new wholeness within. Even in the eyes of those authors still committed to religious transcendency, works of art were regarded as a means to restore lost meaning to the self and the world.

The shock of the First World War toppled hitherto widely held assumptions of unquestionable European supremacy; the conflict precipitated a crisis whose full consequences were felt in the West after the armistice. As if by after-shock, writing in the Americas and in the East either turned away from Western European models or assimilated them to express their own view of modernity.

When coming to grips with reality, not all writers had shown particular enthusiasm for technical breakthroughs and the waning of traditional values; in fact, their works rather expressed foreboding of catastrophe in apprehensive, anguished or nihilistic terms. Even before hostilities ceased, horror and profound disgust with war led some authors to take up a provocative, iconoclastic attitude and to denounce the shortcomings of both reason and culture with their various moral, ideological or aesthetic taboos. While many writers spoke out against the war and the societies responsible for it, few actually took up the conflict as a subject in their works. They preferred to turn away from it, as if to start a new chapter. The rejection of old values encouraged a cult of non-sense. However, the lifting of Europe's antiquated yoke also liberated fresh, dynamic idealism and sheer joy of life, a rejuvenated language, and new ethical, cultural, social, and philosophical values.

Economic crisis and political disillusion in the wake of the new totalitarian states soon darkened horizons for writers again. Literary works became stages for conflict, with characters placed on the brink. Convictions were shaken to the core, and one's identity, role, and very purpose in existence were now questioned in a world henceforth considered absurd. Many writers became involved in desperate struggles on behalf of peace or against fascist ideology in their works; some sacrificed their freedom and even their life.

The Second World War tore the world apart, and its demented atrocities and sadistic acts of cruelty defied all rational comprehension, further swelling intellectual and emotional bewilderment. Anguish reached its peak with the threat of atomic apocalypse. Nevertheless, even in the darkest or most nihilistic novels, many protagonists experienced moments of wholeness, or peace, regardless of whether or not such characters were fated to die in tragic circumstances. Such a trend, even in the most anti-artistic works, seemed to affirm that, beyond all the would-be humanistic demagoguery with its attendant conflicts and despair, the faith in human worth consecrated through the aesthetic act could endure worldwide. This faith in the individual also found its expression in the writings of women, who defended their rights, were listened to and were recognized as equal by the intellectual community in the world at large.

The movement known as *le nouveau roman* (new novel) in France in the 1960s served as a blanket term for a whole host of literary experiments. While this vogue did not seem to extend equally to other countries, translations in many languages testify to the movement's popularity. In the *nouveau roman*, the central subject is banished, and the characters are devoid of memory. Although such an approach precludes any attempt to search for meaning, this genre lent itself to explorations in form and language. Inviting the reader to participate in creating fictitious or gratuitous meanings, writers submitted various possibilities for staging a scene or concluding a novel.

Over the last twenty years, representational works, and particularly autobiographies, have proliferated. The value of such first-hand accounts lies in the coherence of the narrator as witness regardless of his or her standpoint or place of origin. This demonstrated that the individual, as citizen of this planet, was seeking to be recognized through literature. Some new works have shed various constraints and the normal barriers between genres (prose, poetry, essays), while incorporating components inspired by less prestigious genres such as detective or adventure novels, or science fiction. Writers gave free rein to their imagination, roaming at will through literature related to everyday life, fantasy, myth, or parody. Periods and places may multiply and intermesh within the same text, with the purported narrators themselves becoming manifold. But, even though such writing may question all established meaning, or even claim to be purely gratuitous, it can nevertheless disclose fresh truths at unexpected turns. Furthermore, the development of planet-wide means of communication offers writers and their readers new prospects, with the latter increasingly expected to take part in the act of creating and circulating literary works.

## EUROPE

Few authors took the First World War for their subject matter, though English poet Isaac Rosenberg did try to express the experience in an apocalyptic rendering, while France's Henri Barbusse made the unfamiliar life of the trenches better known to the public in an unusual and harrowing journal (*Le Feu*, 1916). Barbusse joined novelist Romain Rolland (1915*) as a member of the pacifist group, Clarté. Rolland published articles condemning the war (*Au-dessus de la mêlée*, 1915), drawing fire from German and French circles alike. Despite a Nobel Prize awarded in the

same year, Rolland continued to be accused of treason; but as a *world citizen*, he persisted in working towards universal independence, generosity, and peace. The feeling of catastrophe and the profound crisis engendered by the horror of war left many writers in emotional disarray. In 1916, in both Europe and America, a violent desire to break with all forms of traditional arts and beliefs arose. Springing up from a deep-rooted unease felt throughout the world, this trend crystallized in the dada movement in Zurich (1916), where a number of young Europeans, led by Romanian poet Tristan Tzara, deliberately courted scandal. This nihilistic movement found echoes in many lands.

This was particularly true in Germany, where expressionism offered fertile soil. While they do have their differences, works of the expressionist school, inspired by Friedrich Nietzsche's philosophy of protest and by Sigmund Freud's ideas on human psychology, were at one in aiming to strip off smug bourgeois masks and to revolt against father figures and other forms of social or hierarchical authority. Absurd or grotesque manifestations of reality were often depicted in burlesque forms and language. Gottfried Benn's macabre poetry evoked urban rot and wretchedness. In one of his short stories, the main character is a surgeon who loses his own lucidity after operating on the brains of more than two thousand corpses (*Gehirne*, 1916). Personally confronted with the spectacle of butchery, the poet Georg Trakl sought to express the mayhem through apocalyptic imagery (*Sebastian im Traum*, 1914), then committed suicide shortly afterwards. The expressionists strove to give words to their deepest anxieties regarding the threat posed by the modern world and to their hopes for a better world. Most of their works were later consigned to the flames by the Nazis, who considered them degenerate. The novel, by Alfred Döblin, *Berlin Alexanderplatz* (1929), which broke with all conventions and seemed as incoherent as the reality it sought to portray was another 'degenerate' work. A similar fate befell the writings of Leon Feuchtwanger, whose novels on the fate of the Jewish people (*Jud Süss*, 1925, and *Der jüdische Krieg*, 1932) saw their original meaning completely distorted by Nazi propaganda. Franz Kafka would loom as a precursor if increasing familiarity with his work did not show it to be an outcome of the whole expressionist approach. Kafka, who examined the limits of traditional communication, attempted through new language to convey cries, gestures, even conversion to a new faith, although such a conversion could only result in failure, since all writing, according to Kafka, would ultimately yield only non-meaning. Kafka's texts continue to exert influence throughout the world: ranging from *Die Verwandlung* (1912–15), whose protagonist is suddenly changed into an enormous cockroach, to *Das Schloss* (1921–22), where the castle is merely an illusion – just like the attempt to find any meaning through writing.

Tristan Tzara was welcomed in Paris like a messiah. The dada movement's destructiveness had its positive side: it opened fresh avenues of approach. Resorting to spontaneity and free association opened the floodgates of the unconscious, encouraging freer writing and the use of happenstance offered by life. Here was to be found the whole surrealist programme championed by André Breton in his *Champs magnétiques* (1920) and *Manifestes du surréalisme* (1924): automatic writing, the use of the language of dreams, and the search for objective happenstance in

half-serious, half-playful collective creations (known as exquisite corpses) (Plate 132). Later Breton embarked upon a virtually mystic quest for a supreme point, where dreams and reality might no longer be mutually exclusive (*Les Vases communicants*, 1932). Several poets continued to experiment in free verse forms along with Breton. Robert Desnos explored dreams (*Deuil pour deuil*, 1924; *La Liberté ou l'amour*, 1927). Pierre Reverdy's sober surrealist imagery could run the full gamut of readers' emotions (*Les Epaves du ciel*, 1924; *Main-d'oeuvre*, 1949). The verse of Paul Eluard, the poet of surrealist love, expressed the universe as seen through the desire for women (*La Vie immédiate*, 1932). During the Second World War, Eluard became a symbol of the Resistance with his *Poésie et vérité* (1942) and *Au Rendez-vous allemand* (1944).

To return to the 1920s, if the term *via negativa* may be applied to a poet's quest, then Paul Valéry's work is the best example; the sparse result of a compelling drive to attain perfection is purely an exercise, a game, the application of mental toil. It is the mind's ability to be anything – its exploration, the detached knowledge of the Great Work, as he called the ways of the mind – that interests Valéry (*La Jeune Parque*, 1917; *Le Cimetière marin*, 1920; *Variété*, 1924–44).

Marcel Proust's *A la Recherche du temps perdu* (1913–22) rose above the day's political, ideological or literary disputes. The writer caused buried memories to rise from the uttermost depths of the unconscious, reconstructing and capturing a mobile, fluid reality perceived with such art that it came to seem more real than reality. The narrator thus brought an entire society back to life, described, often not without irony, with all its underpinnings and illusory values and changes, in addition to the role played by imagination and desire through the intermittences of the heart. Proust's writing reached peaks of ecstasy where all the bonds of time seemed to come loose, the present was denied, and timelessness affirmed. Proust's work would profoundly mark the entire twentieth century.

So did the books of the Irish writer James Joyce, whose novel *Ulysses* (1922) sought to weave twenty-four hours of a Homeric – but hardly heroic – existence, through inner monologue and stream of consciousness. His resulting text jumbled thoughts, sensations, desires, and dreams, while abandoning any traditional plot line. Nevertheless, in terms of artistic structure, this odyssey of the consciousness did faithfully follow its model, Homer's *Odyssey*. But in *Finnegan's Wake* (1939), Joyce, like a Platonic creator-god, wrought a poem whose central Proteus-like character constantly changed, while words shifted and took in additional letters and syllables, endlessly adopting new forms according to the needs of the text. Even today, in the farthest reaches of the earth, writers and poets are wringing extra meaning from language in the manner invented by Joyce.

In England, John Galsworthy (1932*), who wrote in the traditional manner, continued to satirize Victorian and Edwardian society, greed and hypocrisy, in his great 'tale' *The Forsyte Saga* (1888–1922). The influence of Proust and Joyce is evident in Virginia Woolf's vibrantly poetic and musical writing, which sought to catch the most elusive emotions (*Mrs Dalloway*, 1925; *The Waves*, 1931). D. H. Lawrence attempted, for his part, to shake off the shackles of puritanical Christianity and the fetters of an alienating and absurd civilization, in order to recover a natural relationship with the cosmos (*Women in Love*, 1921; *The*

*Plumed Serpent*, 1926). In France, poet and dramatist Paul Claudel saw in nature, as a whole, something to be 'rounded off to a finish', and believed that only through complete unfolding might the world acquire meaning (*Le Soulier de satin*, 1924). Renunciation procured its own spiritual joy and a feeling of possessing the universe.

With *Siddhartha* (1922), the Swiss writer Herman Hesse (1946*) turned towards Buddhist models in his quest for fusion with the cosmos. In 1943, he evoked a secular abbey of the year 2200 whose monks would indulge in gratuitous mystical play (*Das Glasperlenspiel*). By contrast, Austria's Robert Musil saw incestuous love and the quest for the One dissolving in the failure of a disintegrating Austro-Hungarian Empire (*Der Mann ohne Eigenschaften*, 1930–42). Germany's Thomas Mann (1929*) (*Der Zauberberg*, 1924) turned a sanatorium into a symbolic home for the declining Western civilization; with ironic realism, he conjured up 'the world's feast of death' from which he nevertheless hoped love might spring. In exile in California, Mann continued his struggle against Nazism and pursued his work (*Doktor Faustus*, 1947).

The American-turned-British poet, T. S. Eliot (1948*), in a long, cryptic poem, *The Waste Land* (1922), diagnosed the illness of the modern world as a lack of religious consciousness. Among other things, the poem dismisses as vain the various attempts to find any kind of salvation. The poets of the 1930s followed Eliot in his conversion, but W. H. Auden turned away from metaphysics to take an angry look instead at the social conditions of the working class.

In the Soviet Union, writers expressed in their own way the prevailing unease felt by other authors of the time. The October Revolution sparked a proletarian-oriented literature that dwelt upon the exploitation of workers and the spirit of the homeland. But with censorship imposed in 1917, important writers became dissidents defending creative freedom. Mikhail Bulgakov bitterly satirized the bureaucracy in his *D'yavoliada (Devilry*, 1925), a work that foreshadowed his masterpiece, *Master i Margarita (The Master and Margarita*). In this novel, finally published in 1966, Satan descends upon Moscow and sows discord and panic among the system's Pontius Pilates and other toadies. The author mingled two time periods by taking up the story of Christ, thereby achieving the work that Dostoyevsky had hoped to write. On the subject of war, Stanislavsky's 1926 staging of Bulgakov's *Beg (Flight*) scandalized the literary establishment. Boris Pasternak (1958*), considered one of the greatest Russian poets, wrought lyrical, timeless, imagistic verse, seeming to hover above present concerns – and this was held against him. Nevertheless, Pasternak did compose verses on the horrors of the Second World War. His celebrated novel *Doctor Zhivago* angered the Soviet authorities, and had to be published in Italy (1957). Pasternak narrated the lives and passions of characters caught up in the chaotic whorls of Russian history around 1905. Only in 1987 was Pasternak's work rehabilitated. By contrast, *Tikhii Don (And Quiet Flows the Don*, 1928–40), by Mikhail Sholokhov, was warmly approved as a model of Socialist realism, with its flowing narrative in the Tolstoyan manner evoking civil war between Reds and Whites in the Cossack region, along with depictions of the peasant world and a tender love story. A group of young writers known as the Serapion Brethren, under the protective wing of Maxim Gorky tried to reform prose in the early 1920s by marking

distance with conventional imitation and by yielding pride of place to the spoken language. Mikhail Zoschenko resorted to *skaz*, a mixture of slang, ancient forms, and ready-to-use modern expressions, to mould his tales (*Koza, The Goat*, 1924). Isaac Babel depicted the civil war with original imagery in his *Konarmiya* (*Red Cavalry*, 1926), while describing the lower depths of the Odessa Ghetto through the story of an almost legendary bandit (*Benja Krik*, 1927).

Poetry was modernized through the verse of revolutionary poet Vladimir Mayakovsky (*Pro Eto/About This*, 1923). Mayakovsky was soon crushed by the contradictions between political constraints on the one hand (the method of dialectical materialism), and the search for formal liberty, on the other. No less torn by conflict was his domestic life, and he committed suicide in 1930 shortly after completing *Vo Ves Golos* (*At the Top of My Voice*), in which he carried poetry to new heights. The remarkably erudite poet Osip Mandelstam questioned the very essence of human beings in his *Tristia* (1922) and *Voronejskie tetradi* (*Voronej Notebooks*) (1935–37). Criticized, hounded, and finally interned, Mandelstam died in a concentration camp, and his contribution was only recognized much later. The great poet Anna Akhmatova, another victim of blistering attacks, was never published after her collection *Anno Domini MCMXXI* (1921). Not until 1956 did the review *Literary Moscow* make known her masterpieces like *Rekviem* (*Requiem*, 1935–40), in which the sufferings of a wife and mother mirror those of a whole people. Young poets like Yevgeny Yevtushenko, Andrey Voznesensky and B. Okujava then took up the same cause, expressing a desire for freedom and change in passionately lyrical poems, while aspiring to a literary renaissance. Konstantin Fedin, in a highly wrought novel, depicted the tragic fate of a revolutionary intellectual caught in the vice of prevailing ideological blindness (*Goroda i Gody, Cities and Years*, 1924). Rejecting psychologism and harking back to Tolstoy's 'living man', Aleksandr Fadeyev (*Razgrom, The Nineteen*, 1927) also portrayed the anguish of intellectuals trying to fight the system. In 1927, Andrei Platonov denounced forced labour in a collection of tales, *Epifanovy Slyuzy* (*Epiphan's Sluices*). Platonov's novel *Chevengur* (1928–29) described a family of workers whose revolutionary idealism is tempered by Stalinist reality. Only in 1980 was Platonov's work seriously recognized in the Soviet Union as one of the richest and most original literary creations of our time. The Soviet regime once again tightened its control on literature in 1946. In the name of peace, Ilya Ehrenburg was able to denounce capitalist societies in such novels as *Padenie Parija* (*The Fall of Paris*, 1941–42) and *Ottepel* (*Thaw*, 1947). But his *Chernaja Kniga* (*Black Book*), a document on the Holocaust which he helped put together with a Jewish Anti-Fascist Committee, was never allowed to see the light of day, and the committee itself was dissolved in 1948 in an atmosphere of persecution against anyone branded as a *cosmopolite*: and thus began party strictures against Jewish authors, even those once admired, like Zoschenko or A. Akhmatova.

Among Russian writers in exile, Ivan Bunin (1933*) published a great autobiographical novel in the Proustian manner, known in English as *The Life of Arsenev*, a work glowing with profound philosophical questionings and considered one of the masterpieces of Russian prose (Plate 133). Vladimir Nabokov, a Russian writer steeped in European culture, who eventually moved to the United States, became as great a novelist in English as in his native language. His masterpiece in Russian, *Dar* (*The Gift*, 1937–38), shows his desire to evoke his Russian heritage to forge an identity, but not without observing a certain ironic distance from his subject, if only through wit and a sharp critique of literature. Even in exile, Joseph Brodsky (1987*) penned works of a virtuosity that followed in the St Petersburg tradition of Mandelstam and Akhmatova, exploring every possible avenue of poetic writing. Imprisoned for 'social parasitism' in 1964, he was eventually released and immigrated to the United States in 1972. He is regarded as one of the greatest poets of his generation (*Ostanovka v pustyne, A Halt in the Wasteland*, 1970; *Uraniia, Urania*, 1987; *Primechaniia k paportniku, The Fern's Remarks*, 1990).

In France, Catholic writer Georges Bernanos described characters symbolizing good pitted against evil, in almost Manichaean combat (*Sous le Soleil de Satan*, 1926). The writer's poetic and dramatic flair casts a supernatural pall over this sombre novel, as it does over *Les Grands Cimetières sous la lune* (1938), where the narrator, a witness to the Spanish Civil War, strives to understand the nature of evil. The failure of traditional values, economic crisis, and the rise of totalitarian regimes left Western writers profoundly unsettled; they became involved in social struggles or desperately endeavoured, in solitude, either to bestow new meaning upon life, or to deny that it held any meaning at all.

In Spain, among other poets to emerge from the so-called Generation of 1898, Antonio Machado helped free lyric poetry from pretentious rhetoric, and plumbed the depths of the soul: through love, life, death, and time (*Campos de Castilla*, 1912–17). Machado thus blazed the trail for the starkly simple poetry of Federico García Lorca (*Romancero gitano*, 1928), which revealed surrealist influences, as did the verse of Vicente Aleixandre (1977*) (*La destrucción y el amor*, 1935), where language appeared to rise from the abyss of dreams. After a symbolist and modernist period, Juan Ramón Jiménez (1956*) used poetry to look beyond the appearance of things in the search of their uniqueness and essence. His poetry then went on to express an ecstatic joy (*Animal de fondo*, 1947), especially in his later work *Dios deseado y deseante* (1949). It was mainly Lorca's outspoken, liberating and innovative drama that earned him an international reputation. His three tragedies, *Bodas de sangre* (1933), *Yerma* (1934), and *La casa de Bernarda Alba* (1936), three powerful allegories whose roots reached far down into Andalusian soil, expressed life's revolt against all forms of oppression. Lorca's murderers, members of Franco's forces, made no mistake about it: they killed the poet shortly after the appearance of his last drama in 1936. Miguel de Unamuno also died in 1936 while under house arrest. His essentially philosophical works dwell on human contradictions in the face of destiny. As early as 1914 (*Niebla*) and throughout his writing career, he was preoccupied by themes concerning the relationship between a character and its author and how these might lead to considerations of the worth of any revolt against fate. His *Tres novelas ejemplares* (1920) used writing as a means of speculating on the links between the different aspects of a single personality. Spanish novelists of the next generation criticized society. In *La familia de Pascal Duarte* (1942) by Camilo José Cela (1989*), a juvenile delinquent describes how, in yielding to his instincts, he committed crimes that neither his family nor his own conscience could ever

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condone. In new wording and through more than two hundred characters, Cela's *La Colmena* (1951) brilliantly captured the sordid atmosphere of post-war Madrid. The novels of Miguel Delibes, who depicts life in a Castilian village in *Las ratas* (1962) through the monologue of a peasant woman at a wake, possess a universal dimension. Juan Goytisolo deconstructs the official version of historical events and satirizes modern youth in *Juegos de manos* (1954). Luis Martin Santos recounts a single day in Madrid in 1949 with corrosive wit (*Tiempo de silencio*).

In Portugal, Miguel Torga consistently opposed the Salazar dictatorship. Already famous by the 1930s for his great biblically inspired work *A Criaçâo do mundo*, he was internationally recognized for his poetry by 1977. The Portuguese poet Fernando Pessoa was clearly influenced by French Symbolism, Walt Whitman and the English language and its literature. His work, published in reviews under many pen names, expressed different, sometimes contradictory, ideological viewpoints. This was Pessoa's way of seeking a certain form of wisdom, untrammelled by any religious constraints or metaphysical claims. His complete works fill eight volumes (*Obras completas*, 1942–56). Extremely well known and influential among European literary circles, his *Poesias* (1942) were published under the pseudonym Álvaro de Campos. At a later date, numerous very active younger poets became exposed to European influences (surrealism, existentialism, the *nouveau roman*, structuralism), but nevertheless kept an eye on Africa and also on Brazil, as was the case with Alexandre Cabral (*Historias do Zaire*, 1956). José Saramago (1998*) is probably the best-known Portuguese writer active today in theatre, poetry, the novel, and journalism. From his first book published in 1925, *Terra do Pecado*, to his more recent novels like *Memorial do Convento* (1982) and *Evangelho segundo Jesus Cristo* (1991), probably his most controversial work, and the publication of the last part of his diary (*Diario III de Cadernos de Lanzarote*, 1996), his reputation in international letters has never ceased to grow.

In France, Céline's anti-hero was a lucid but merciless character who cultivated hatred of both self and others until he cynically sank into his own moral quagmire (*Voyage au bout de la nuit*, 1932). In 1933, André Malraux juxtaposed dramatic and blood-soaked scenes in almost journalistic depictions of a Communist insurrection in Shanghai, with a vast and varied host of characters groping for the meaning of life, in *La Condition humaine*. In a gesture of fraternal and sacrificial communion, a young revolutionary helps one of his comrades, sentenced like himself to be burned alive, to die more easily by giving him his own cyanide. On the threshold of death, the self could thus fuse with the real and even be projected into eternity. Such nearly ecstatic moments mark the apex of many contemporary works, even though these otherwise seek to exclude any totalitarian discourse or metaphysical purpose. Beyond despair and the absurd, Malraux expressed his faith in humanity's capacity continually to affirm its presence through art or action; human beings must stay constantly attentive to life's message, perceived as an 'infinite possibility as to their fates' (*L'Espoir*, 1937).

Novels increasingly concerned with rounding out their authors' previous philosophical writings followed hard upon Malraux's existential anguish. Jean-Paul Sartre drove home the philosophical theses contained in his essay *L'Etre et le néant* (1943) by stretching them to the limit, as it were, in concrete situations illustrated by a novel like *La Nausée* (1938), a collection of short stories like *Le Mur* (1939), and especially the play *Huis clos* (1944). This play, known as *No Exit* in English, confines three characters 'to hell'. The utterly empty consciousness of each one of these three 'dead' creatures, all equally forgotten by those on earth, sinks to such depths as only to exist in the viscous and baleful glare of the other two inmates. Rather than risk walking out the door into the unknown or into sheer nothingness, the three characters choose to face one another in complete bad faith, the *en-soi*. Yet an alternative does exist: the freedom of the *pour soi* – despite the happenstance, the meaninglessness, or the absurdity of things. According to Sartre, each lucid human being should seek such an alternative, while remaining constantly on guard against any temptation to mythologize reality. Since every word is an act, the writer put his or her entire responsibility on the line.

In the view of Albert Camus (1957*), human beings may transcend their limitations through revolt (*L'Homme révolté*, 1951), despite a gnawing sense of the absurd, with acts resembling those of Sisyphus, the mythological Greek hero eternally doomed to roll his heavy stone up a hill only to see it slip from his grasp and roll down again. Nevertheless, in Camus's *L'Etranger* (1942), as in the novels of Malraux and Sartre, the darkest moments, on the very threshold of death or even suicide, can also yield a vision of ecstasy – however utterly negative and desperate the revealing experience might be. Moreover, even at their most pessimistic or anti-heroic moments, Camus's works never allow humanity's cause to sink to the lower depths.

Existentialism enjoyed a worldwide vogue. In Romania, poet Marin Sorescu saw revolt as the only way out from fate's absurdity (*Don Quixote's Youth*, 1968). For Marin Preda, regarded as a first-rate novelist, the peasant is a philosopher who cultivates his garden with humour (*Moromeţii*, 1955); his satire of the regime and its institutions resulted in the meditations of *Cel mai iubit dintre pămînteni* (*The Most Beloved of All Mortals*, 1960). Preda's ironic detachment is also to be found in the works of the late philosopher Emile Cioran, who chose exile in France and regarded history as 'cacophony' and perceived self-deluding agitation with cynical distaste but also humanistic empathy (*L'inconvénient d'être né*, 1974). The struggle on behalf of human rights waged by Paul Goma, also in French exile, has become a symbol. Goma's works evoke the absurd world of prisons, repression, and torture (*Le Tremblement des hommes*, 1979). The theatre of the absurd of yet another Romanian exile, Eugène Ionesco, drawing on humour from his native land, scored considerable success on the French and international stage.

Czechoslovak literature was racked by the country's successive Nazi and Soviet occupations, and many intellectuals went into exile. Before 1938, Karel Capek was famous for a work of science fiction (*War of the Salamanders*, 1935), and especially for a trilogy of novels: *Hordubal*, *The Meteor*, and *An Ordinary Life* (1934–37). As early as 1919, Capek was translating Apollinaire and blazing the trail of 'poetism,' a surrealist movement that found its finest expression in the powerful imagery of Vitezslav Nezval (*Edison*, 1928) and in the lyricism of Jaroslav Seifert (1984*) (*Garbed in Light*, 1940). Seifert soon symbolized resistance against the Nazi and Soviet occupations. As of 1948, 'official' or at least 'tolerated' writers could remain on good terms with the regime, but others had to publish

clandestinely or go into exile, especially after 1968. Thus Bohumil Hrabal, the best-known author to remain in Czechoslovakia, was forced to publish abroad (*Too Loud a Solitude*, 1976). Milan Kundera, probably the most famous of all contemporary Czech writers, first brought out, in his native tongue, *Valcik na rozlouecenou* (*A Waltz of Farewells*, 1973), a tragic tale told in an ironic, deliberately banal tone, as if from a distance, thereby stripping the story of the grandeur normally accorded to tragic themes. After moving to France in 1975, Kundera published, in French, the successful *L'Insoutenable légèreté de l'être* (1984) and *L'Identité* (1977). Kundera attempts to render the complexity of the modern world while remaining clear, hypothetical, playful and ironic, thereby conferring a post-modern stamp on his work.

When not drawing on the resources of their folklore or national history, Bulgaria's pre-war writers were busy attempting to free their poetry from its traditional fetters. After the Second World War, a love of life coupled with metaphysical disquiet haunted works that expressed the crisis in traditional values as well as the rejection of the new values. Pavel Vezinov spoke out against the decadence of humanism, and in *The White Lizard* (1977) branded modern man as a 'spiritual eunuch'.

In Hungary, Lajos Kassak, in his eight-volume work cast in autobiographical form, *A Man's Life* (1927–35), told the story of the rise of a self-taught mechanic. Pursuing the same socialist vein, Attila Jozsef's verse, the most important Hungarian poetry written in the interwar period, expressed working-class views, mingling literary reminiscences with snatches of popular songs. After 1945, an intellectual elite persecuted under Nazi rule was hardly in a position to re-emerge under the Soviet regime. Tibor Dery (*The Unfinished Sentence*, 1966) denounced dictatorship, and Jószef Lengyel, the concentration camps (*Bitter Bread*, 1966). Many post-modern writers chose for their model the sardonic novels of István Ôrkény (*The Tót Family*, 1968; and *The Minimyths*, 1970), influenced by the works of Beckett and Ionesco.

Modern works of Polish literature mainly drew their inspiration from the classical French novelists or from the two founding fathers of twentieth-century letters: Proust and Joyce. Witold Gombrowicz is considered one of the greatest contemporary Polish writers (*Ferdydurke*, 1937; *Journal*, 1957–66). In the 1990s, the poetry of Wislawa Szymborska (1996*) was recognized as a major work by the literary world (*Unexaggerated Death*, 1997).

In Italy, the futurist and modernist adventures of such poets as F. Tommaso Marinetti caused some literary upheaval during the First World War. The drama and novels of Luigi Pirandello (1934*) expressed nihilism tinged with irony through depiction of the disintegrating identities of their characters (*Sei personaggi in cerca d'autore*, 1923). Pirandello's theatre has influenced many modern playwrights. Alberto Moravia's first novel, *Gli Indifferenti* (1929), was interpreted as a condemnation of decadent bourgeois. His later writings brought him closer to the manner of the Surrealists. After the decline of literature during the Fascist years, the neo-realistic novel returned to the fore, and writers sought to exclude an 'arcane' approach to literature, which was criticized for shunning social realities. The novels of Carlo Cassona and Giorgio Bassani (*Le Storie ferraresi*, 1960), profoundly influenced by Proust and Joyce, evoked the grimness of exclusion and solitude in themes related to the resistance, deportation and regionalism.

*Se questo è un uomo* (1958), Primo Levi's autobiography as a survivor of the Nazi death camps, is one of the most gripping of all eyewitness accounts of the utterly degrading slavery of that daily horror, depicted with unusual courage, modesty, and grandeur of the soul. In the 1960s, Italian writers mainly focused on the world of labour and industrialization, to the extent that their work came to be labelled as a 'literature of industry'. Pier Paolo Pasolini's hard neo-realism and political involvement melted into something approaching hedonism in his final collection of poetry (*Trasumanar e organizzar*, 1971). Dino Buzzati's fantastic approach resulted in reflections on love, the absurdity of fate, and death, in such novels as *Il Deserto dei Tartari* (1940) and finally *Il Bestiario* (1991), where the author's fable uses animals to show our gradual slide into an absolutely unthinkable reality. The fantastic fables of Italo Calvino are also noteworthy. One character in his major trilogy, an eccentric nobleman in an imaginary eighteenth century, climbs up a tree and refuses to come down because of the world's absurdity (*Il barone rampante*, 1957). Calvino could also show characters acting out sometimes-hilarious situations in more realistic tales, without revealing their innermost thoughts but still reflecting considerable art (*Palomar*, 1983). Dreams often blur reality in Elsa Morante's novels; in *La Storia* (1979), war victims revolt against atrocities as old as the world. Umberto Eco first became known in academic circles for his essays on semiotics, but then achieved international renown with a first historical-detective novel: *Il Nome della rosa*, 1981. Not without wit, Eco described medieval monks seriously grappling with the limits to human knowledge in a fourteenth-century abbey, stressing the importance of wisdom, reason, and freedom against folly and superstition.

In Greece, the two writers who set the tone for contemporary literature were Nikos Kazantzakis and Konstantin Kavafis (more commonly known as Cavafy). Kazantzakis was open to every kind of literary, political and spiritual influence, and his novels were universally acclaimed. They expressed a feeling of anguish and alienation, which the author struggled to surmount in such works as *Alexis Zorba* (*Zorba the Greek*, 1948), and *Letter to El Greco* (1961). Cavafy, in his poetry, mingled popular and learned language, linking the ancient world to the modern in a mythical and ironical dimension. After 1945, a 'generation of the defeated', committed to moral combat against political oppression, emerged on the literary scene. Among these, George Seferis (1963*) gave a voice to despair and suffering, but also to his faith in humanity and its future (*Three Secret Poems*), while Odysseus Elytis (1979*) (*The Tree of Light*, 1971) pegged his hopes on the sea, as the very symbol of Hellenism. In the 1970s, sarcastic wit could blend with political opposition. Writing in poetic prose mingling Stendhalian inspiration with stylistic innovations, S. Tsirkas's trilogy (*Akybernates politeias, Drifting Cities*, 1960–65) is widely considered the greatest novel in modern Greek. The work follows ethnic Greek leftists through the Second World War in Jerusalem, Cairo and Alexandria. Taki Theodorakis tells of the quest of a Greek painter searching for a landscape which he finally discovers within himself – just as his native Greece contained such a landscape within herself as a symbol of the country's contemporary identity (*Landscape of the Absolute*, 1992).

The Albanian writer Ismail Kadaré is quite prolific. His novel *The Concert*, 1988, at once tragic, burlesque, poetical, and metaphysical, based on the relations between Beijing

and Albania, is considered his masterpiece. Kadaré's *Three-Arched Bridge*, a medieval chronicle about the building of a cursed bridge, met with international success in 1981. Another symbolic bridge supported a blood-drenched tale of clashing cultures at once linked and separated down the centuries in the 1945 novel by Bosnian writer Ivo Andrič (1961*), *The Bridge on the Drina*.

In France, Louis Aragon's work in both poetry and prose extended over more than 60 years: from his surrealist novel *Paysan de Paris* (1926), through a cycle of Marxist novels in the 1930s, tirelessly denouncing the rising tide of fascism, to a less politicized autobiography in 1956, and down to his final poems, *Les Adieux et autres poèmes* (1982), in which he continued to stress that 'love is absolute'. Mainly concerned with communicating experience, writers no longer restricted themselves to any particular genre. Michel Leiris, a former surrealist, used such forms as journalism, poetry and the essay, to create a vast and complex autobiographical work (*La Règle du jeu*, 1939–76). Georges Bataille, another ex-surrealist who wielded considerable influence, composed works difficult to classify, such as his *Somme athéologique* (1943–45) or 'Mme Edwarda' (1942), a short story whose violent eroticism provoked a scandal. Bataille sought a sort of illumination, even 'consummation', through the contemplation of pain, enjoyment enhanced by fierce eroticism, or transgression of taboos. Literature was only acceptable to Bataille if it refused to accept itself: 'Whoever does not die on account of being only a man', Bataille used to say, 'will never be anything but a man.' Through the poetry and prose of former surrealist René Char, odd metaphors shoot forth like lightning bolts, lifting his work to the summits of modern poetry. Although difficult, Char's work endeavours to be 'synonymous with truth' and carries the reader to heights of enjoyment of nature and beauty in the name of peace and our brief life on this Earth (*Retour amont*, 1966; *Dans la pluie giboyeuse*, 1968).

In the early twentieth century, theatre enjoyed less prominence than the novel, but succeeded in arousing renewed interest after the Second World War. By 1950, Ionesco's *Cantatrice chauve* (*The Bald Prima Donna*) was spouting nonsense on the stage, thus marking the birth of the theatre of the absurd. Major sources of inspiration claimed by practitioners of the new theatre were Strindberg, Joyce, Brecht, and especially Antonin Artaud (*Le Théâtre et son double*). As early as 1930, Artaud wanted the stage to become a space for the forces of good and evil – as a metaphor for life. In his view, a 'theatre of cruelty' ought, as for sufferers of the plague, 'to be lancing boils'.

In Belgium, between 1930 and 1939, Michel de Ghelderode developed a powerful dramatic style with *Don Juan* (1928), *Magie rouge* (1931), and *Mademoiselle Jaïre* (1934). His aggressive and vivid plays pursued the tradition of the old Flemish puppeteers, featuring buffoons, executioners and other characters seemingly straight out of the paintings of Bosch or Bruegel. Ghelderode's plays were originally written in French, but were first performed in Flemish in the 1920s at the Vlaamse Volkstoneel, an avant-garde theatre, before touring in Paris and other European cities after 1950.

Ionesco's theatre of the absurd could show human beings turning into blindly egotistical, bestial and ferocious rhinoceroses (*Rhinocéros*, 1960). His stage might fill up with objects before becoming empty once again (*Les Chaises*, 1952). Or a corpse might explode, and crash through panels

(*Amédée ou comment s'en débarrasser*, 1954). Arthur Adamov also expressed the moral failures of his characters through their physical activities: they might limp across the stage, for example (*La Parodie*, 1952; *Off Limits*, 1969). Brecht wished effectively to deprive his spectators of any possibility of catharsis, and his example was followed by the advocates of 'anti-theatre'. Thus Jean Genet basically drew his inspiration from this vein in such powerfully crafted plays as *Le Balcon* (1957), and *Les Nègres* (1959). Armand Gatti cultivated the Brechtian notion of 'epic theatre' to wreak havoc with the basic conceptions of drama, exploring every 'possible me' of his characters (*Chant public devant deux chaises électriques*, 1966). Irish-born Samuel Beckett (1969*), who wrote in English and French, peopled his stage with picturesque characters: human ragamuffins devoid of identity, conviction, will, or any God to believe in (Plate 134). Indeed, in a sense Beckett's 'theatre of the void' is filled with the absence of God as he dramatizes a world emptied of all meaning (*Waiting for Godot*, 1953; *Endgame*, 1957). The new theatre was really consecrated by Beckett's 'visible' and 'literalist' masterpiece, *Waiting for Godot*. Since this sort of drama pointed to no discernible reality which might lie beyond what was being shown on the stage itself, it paradoxically opened the way to a whole new form of literature: the nouveau roman, which enjoyed an extraordinary vogue over the next 20 years.

Alain Robbe-Grillet, the chief exponent of the new novel, was imitated in many countries. The rather vague term *nouveau roman* refers to self-built texts that eschew reference to any reality in existence before the text, in so far as language could allow. Readers are expected to decipher stories to which only the author holds the key. Obsessive fantasies might be exploited, such as rape and other sexual crimes, along with the imagery of delirium, thus whirling the puzzled reader in search of the work's meaning into a vortex of speculation. Such a literary approach did undoubtedly result in some successful achievements; but most works of this school remain word-centred and two-dimensional, and mark the abdication of art's claim, at least in literature, to the right to uncover truths about the world outside or about the human condition. Claude Simon (1985*), in his word-puzzles, jumbled fragments of various images with snippets from history or geography, injecting epithets of colour (*Triptyque*, 1973; *Les Géorgiques*, 1981; *L'Invitation*, 1988). Simon once described his novels as works to be perceived as 'a successfully prepared mayonnaise sauce' (*Orion aveugle*, 1970).

Other poets and novelists experimented with language's arbitrary forms and constraints to turn them into tools for infinitely varied creativity. In his *Exercices de style*, 1947, Raymond Queneau, with his so-called 'OuLiPo Group' (*Ouvroir de Littérature Potentielle*), developed this particular trend first initiated by the surrealists and such writers as Raymond Roussel (*Les Nouvelles impressions d'Afrique*, 1932). Georges Perec came to be one of the main representatives of this school. In *La Disparition* (1969), Perec dropped the letter 'e' entirely from his text; and in *La Vie, mode d'emploi* (1978), he submitted a collection of stories to be composed and combined by the reader in different patterns.

It may be inaccurate to consider Nathalie Sarraute and Marguerite Duras as belonging to the *nouveau roman* school, but they did much to renovate the novel as a genre. Sarraute exposed the little telltale signs that reveal life far more

authentically than traditional discourse or the usual representations of action. Hence, the underlying purpose of her stories tend to disappear from view (*Portrait d'un inconnu*, 1948; *Les Fruits d'or*, 1963). In her starkly rendered dialogues, Duras managed to suggest things unutterable and inaccessible, like separation, loss, solitude, or flights into madness, crime, amnesia. In Duras's *India Song* (1976), characters disappear altogether, leaving only voices to express the author's words. In the 1980s, Duras incorporated subject matter in more classically constructed texts (*Agatha*, 1981; *L'Amant*, 1982), while Sarraute split her own personality in two in *Enfance* (1983), an autobiographical tale. Always one to mystify, Robbe-Grillet also wrote some self-admittedly 'indirect' autobiographical works: *Le miroir qui revient* (1985); and *Angélique ou l'enchantement* (1988).

Other novelists mirrored sometimes very bitter personal experience indeed in their own works of fiction. Elie Wiesel, a survivor of the Nazi death camps and recipient of the 1986 Nobel Peace Prize, erected an 'invisible monument' to his people, whose agony he recounted through the 'mystical power of memory', and thereby commemorated the suffering of all peoples deprived of freedom (*Silence et mémoire d'homme*, 1989; *L'Oublié*, 1989). Marguerite Yourcenar used the historical novel's projection into a different period to shed new light on fundamental questions. Her *Mémoires d'Hadrien* (1951) pondered the meditations of a Roman emperor as death approached, while in her *L'Oeuvre au noir* (1968), she related the philosophical quest of an imaginary physician in the stormy period of the Renaissance (Plate 135). Edmond Jabès (1965*), questioned existence and its relation to God in short prose poems that were also philosophical essays (*Le Livre des questions*, 1963–73; *Le Livre de l'hospitalité*, 1991).

Since 1980, an increasing number of writers have been trying to shake off the shackles of the novel, a genre now regarded with suspicion even though still recognized as one capable of handling anything that a writer may wish to pour into it. More and more authors are turning to short stories and other brief works, where fiction, musings, poetry and history are mingled so as to allow the narrator to capture the unpredictable.

In England, writers like Aldous Huxley, George Orwell, and William Golding (1983*) denounced, in the blackest possible anti-Utopias, the shortcomings of individuals and society as a whole. In *Brave New World* (1932), Huxley offered a pessimistic vision of a future dominated by Americanization and scientism. Under the cover of a Swift-like fable, Orwell satirized a world of animals rebelling against exploitation by humans. The animals end up proclaiming the equality of all animals, but the triumph of the exploited is short-lived: the pigs betray the revolution (an allusion to Stalinism) while the dogs (the police) impose a reign of terror (*Animal Farm*, 1945). With his best-known novel, *1984* (1949), Orwell described a state waging a war far from its borders that brings it relative prosperity. But the state's citizens are constantly watched by the eye of 'Big Brother' and are banned from loving and even thinking. The novel's hero stages an unsuccessful attempt at triggering an uprising and narrates the outcome. William Golding harked back to the very source of conflicts where evil is seen almost metaphysically. *Lord of the Flies* (1954) took a hard look at the beast lurking within human beings and drew pessimistic conclusions, illustrated through the strange political organization concocted by a group of children stranded on a desert island, with all its ensuing tragedy. The characters in Harold Pinter's plays are significantly hard put to it to express their own thoughts, which stem from ambiguous motivations they scarcely understand (*The Homecoming*, 1965; *Betrayal*, 1980). More novels are offering variant possible endings (as with John Fowles) or actually self-deconstructing (as with Graham Swift); others are becoming complex self-parodies, like the works of David Lodge (*Nice Work*, *Parlour Games*, 1988).

During the Nazi period, German writers in exile were politically active. Bertolt Brecht, first in Scandinavia and then in California, continued to apply his aesthetic theory of efficiency to his revolutionary plays, rejecting all notions of catharsis (*Mutter Courage und ihre Kinder*, 1939; *Der gute Mensch von Sezuan*, 1938–40; *Der aufhaltsame Aufstieg des Arturo Ui*, 1941). After the war, realistic-minded writers depicted a Germany raised from its ruins and sought to explain her drama from within, as with Heinrich Böll (1972*) (*Haus ohne Hüter*, 1954; *Ansichten eines Clowns*, 1963). Günter Grass (Plate 136) told the story of a child symbolizing the entire German people, whose growth was stunted by its past (*Die Blechtrommel*, 1959). In *Mein Jahrhundert*, 1999), a partly autobiographical work, Grass stages his own life story, with his customary biting wit, summing up each year of 'his century' with a tapestry of events and characters.

In Switzerland, Max Frisch showed how mass prejudice and lies might entrap a whole society in the clutches of anti-Semitism (*Andorra*, 1961). Lying somewhere between the dramas of Brecht and Ionesco, Friedrich Dürrenmatt's plays staged grotesque characters bereft of certainties, cast adrift in a world whose ideologies amounted merely to farce (*Die Physiker*, 1962; *Der Meteor*, 1966). The 1970s and 1980s gave rise to a more personal and autobiographic literature dwelling on suffering and death. Fritz Zorn perceived cancer as the significant illness of a morbid environment, with Zurich's bourgeoisie as the disease's agent (*Mars*, 1981).

East German writers who rejected their regime fled to the West, or at least published there. Günter Kunert left East Germany in 1979. In 1980, Christa Wolf was the first East German writer to be appreciated in West Germany. After the fall of the Berlin Wall in 1989, the two German literatures fused. Increasingly, the involvement of German-language writers revolved around peace and ecological threats to the planet. In 1984, Kunert called for self-knowledge through meditation 'to bear with this world which was constantly dissolving in nothingness' (*Zurück ins Paradies*). Even more intensely than many other post-modern European writers, young German authors expressed a sense of depersonalization, disintegration of the self, solitude, and fear, faced with the emptiness of modern life. In Peter Handke's work, the individual's alienation and pain found expression through novels, short stories (*Versuch über die Jukebox*, 1990) and plays which jolted audiences, deconstructed rhetorical models, and revealed the constraints of language from which their author sought to break away. Handke even tried to undo the very gestures he regarded as hindering communication, going so far as to stage a completely mute drama (*Der Mündel und sein Vormund*, 1969.) The German-language autobiographical works of Elias Canetti (1991*), born in Austria-Hungary but a naturalized British subject, included the reflections and aphorisms of an individual who, after experiencing a tormented childhood and young adult life, still felt that life

was a value to be treasured, wishing as he did 'to live as if death did not even exist' (*Die Provinz des Menschen*, 1942–72; *Aufzeichnungen*, 1976–78).

As for post-Stalinist literature in Russia, Alexandr Solzhenitsyn (1970*) wrote realistic, classical works couched in fresh language to bear witness to his experience as an inmate of the Gulag and as a fighter against oppression. *V kruge pervom* (*The First Circle*, 1955–58) related the spiritual castration of intellectuals interned in a 'luxury camp', but also showed how the world of concentration camps could forge and temper the mind. The immense fresco of his *Krasnoe koleso* (*The Red Wheel*, 1971–83) dwelt on the causes of the Russian Revolution. His story *Odin den iz zhizni Ivana Denisovicha* (*One Day in the Life of Ivan Denisovich*, 1962) imparts the horror of daily life in the Gulag, playing on the reader's emotion and indignation, and encouraging a nostalgia for traditional values. The countryside, natural beauty, and moral and religious values, even nationalism, were increasingly common themes in Soviet literature, giving rise to an abundance of 'rural' literature. V. Belov related how a peasant manages to triumph over the trials and tribulations of the kolkhoz, thanks to his faith in those values, in *Privychnoe delo* (*A Matter of Habit*, 1966). V. Rasputin told the story of an elderly woman on her deathbed, surrounded by her four children; in the highly successful *Matushka* (1970) he went as far as to reject anything that belongs to the modern world. In V. Astafyev's *Pechal'nyi detektiv* (*Sad Detective Story*, 1986), nostalgia for the countryside is coupled with xenophobia, and even anti-Semitism. The crisis of the agrarian revolution, a thirst for freedom and opposition to the nuclear arms race were all subjects tackled by the popular Kyrgyz writer Chingiz Aitmatov (*Proshchay, Gulsary!*, *Farewell, Gulsary!*, 1966; *I bol'she veka dlitcia den'*, 1980, *The Day Lasts More Than a Hundred Years*). In the latter story, with shades of science fiction, the author wrote of a robot-person suffering from amnesia amid the ruins of his country in a world of folly. The war, which enabled official literature to sing the praises of patriotism and Soviet heroism during the Stalinist period, was bitterly and realistically described by V. Nekrassov (*Vokopakh Stalingrada*, *In the Stalingrad Trenches*, 1946), by K. Simonov in his novels (*Dni I nochi*, *Days and Nights*, 1944; *Jivye I Mertvye*, *The Living and the Dead*, 1960) and in his poetry. War and post-war realities were described by young novelists such as I. Bondarev, who denounced Stalinist repression of those who had fought for their country and their families (*Poslednie zalpy*, *The Last Salvoes*, 1959; *Tichina*, *Silence*, 1964). V. Bykov (*Mertvym ne bolno*, *The Dead Do Not Feel Pain*, 1966) showed how war pushes people to their limit and forces them to ask fundamental questions about their condition. In 1961, V. Grossman completed *Jizn i Sudba* (*Life and Fate*), the final part of a long, highly controversial tableau published in 1952. His last novel, published abroad and only in 1980, deals with Soviet society after Stalingrad and compares Nazism with Stalinism.

At the end of the 1950s, the Sputnik era, science fiction became a very popular genre, enabling authors, whose works very often circulated underground, to express their condemnations of oppression more freely. For example, I. Efremov's *Tumannost Andromedy* (*The Nebula of Andromeda*, 1957); or *Lezvie britvy* (*The Razor's Edge*, 1963), and *Ulitka na sklone* (*The Snail on the Slope*, 1966) by the brothers A. and B. Strugatsky. Other writers, like A. Sinyavsky (*Gololëd*, *The Hoarfrost*, 1962), who considered revolt, freedom and the renewal of literature as obvious companions, looked to satirical realism, producing writings of a fantastic nature. In a similar vein, Erofeyev ripped language apart in such works as *Moskva-Petuski* (*Moscow-Petushki*, 1977). But after 1985, in the years following the restoration of freedom of expression, post-modernist prose invaded the world of the novel; reality and phantasmagoria mingled in a kind of 'mythological realism' leading to self-destruction, as in a short story by S. Kaledin whose intellectual hero turns into an undertaker (*Smirennoe kladbishche*, *Tranquil Cemetery*, 1991).

Several Belgian authors staged avant-garde plays in Flemish, while humanist and expressionist aspirations were summarized in Wies Moens's *Celbrieven*, 1920, and Paul Van Ostaijen sought 'pure poetry' in his *Het eerste boek van Schmoll*, 1928. Dutch literature strove to free itself from moral and religious bonds. Gerard Walschap violently rejected Catholicism and expressed the wish to live as a pagan with the greatest possible intensity in his novel *Houtekiet* (1940). Willem Elsschot wrote tales marked by disillusion and irony (*Het Dwallicht*, 1946). After 1950, a brand of poetry claiming inspiration from Artaud and the surrealists adopted the label 'atonal' and sought to express itself in 'visceral' language. Johan Daisne interjected 'magic realism' into his prose, while Hugo Claus (*Le Chagrin des Belges*, 1985) and other fiction writers reflected the influence of experimental German and French novelists.

Indebted to German expressionism, Swedish literature was, especially in the interwar period, tinged with religious feeling: Swedish writers either sought faith, or advocated a secular and free-minded mysticism. In the 1930s, they expressed anxiety over threats of war and their country's neutrality. As early as 1915, Pär Lagerkvist (1951*) wrote with anguish of the horrors of war (*Steel and Men*, 1915) and went on to condemn all forms of dictatorship (*The Executioner*, 1933; *Victory in Darkness*, 1936). Eyvind Johnson (1974*) urged his contemporaries to oppose Nazism (*Krilon*, 1941–43), and wrote many novels and short stories (*Of Rose and Fire*, 1949; *During the Time of His Grace*, 1960). Harry Martinson (1974*) penned the poem *Anaria*, which served as the basis for a famous opera, and several novels including *The Road to Klockrike* (1948). After the war, Stig Dagerman described the anxiety of 'neutral' Swedish soldiers in 1942 (*The Serpent*, 1945). In his play *Sentenced to Death* (1947), Dagerman revealed an existential anguish reminiscent of the works of Kafka and the French existentialists. The 1950s heralded a renewal of interest in regional literature, with the novels of Sara Lidman, who explored the poor and wild North in *The Country of Mulberries and Thorns* (1955), while Lagerkvist turned his attention to more religious subjects (*Barabbas*, 1950). Torsten Ekböms's *Opening Gambits* (1964) bears the influences of the *nouveau roman*.

In Norway, during the Nazi occupation, writers fled or went on strike, while the population buried themselves in the classics in an attempt to protect themselves symbolically from Nazism. War poetry, 'Krigslyrikken', between 1940 and 1945, was published both in Norway and in exile, but only after the war did most such material see the light of day. Two poets, Arnuf Overland and Nordahl Grieg, whose works galvanized the Norwegian resistance, were regarded as heroes. In the post-war years, novels recognized the importance of the individual in making existential choices,

as with Kåre Holt's *The Great Crossroads*. Tarjei Vesaas was renowned throughout Scandinavia for his expressionist works, which rejected the traditional realistic novel in order to describe the hidden and fundamental workings of character. Vesaas's finest works include a collection of short stories, *Winds* (1952), and the novels *House in Darkness* (1945), and *The Laundry Room* (1946).

In Denmark, along with Martin Andersen Nexo's and Leck Fischer's realistic novels written between the wars, the great historical romance by Nis Petersen won acclaim; it is regarded as one of the most outstanding works on ancient Rome. Karen Blixen's work, so fraught with literary allusions and rich in mystery, won international acclaim (*Anecdotes of Fate*, 1958). Klaus Rifbjerg's plays (*Evolutions*) achieved significant success, but opinions vary regarding his lengthy and rather esoteric poem, *Camouflage* (1961).

In Finland, on the heels of the surrealist-inspired movement Tulenkantaja (Fire-Bearer), came a 'social' novel, *Holy Misery* (1919), and a 'vitalist' novel, *Human Beings on a Summer Night* (1934), both by Frans Sillanpää (1939\*). Post-war writer Väinö Linna earned international fame with a first novel, *Unknown Soldiers* (1954), and later with a highly successful trilogy, *Here Under the Polar Star* (1959–62). Linna's criticism of his country's social and political structures caused an uproar, but the work has enshrined the author as a kind of spiritual leader in contemporary Finland.

## THE AMERICAS

### The United States

American literature truly came into its own when writers began turning away from essentially bookish inspiration to consider their own immediate context, either to idealize conservatism, or to seriously criticize it. At the turn of the twentieth century, Henry James had already depicted, in remarkably minute detail, a rich and decadent American leisure class that haunted the drawing rooms of European high society. But James's concern had been mainly aesthetic. With Theodore Dreiser, stories now became careful and sometimes lengthy demonstrations of situations which inexorably determined their characters' fates. Dreiser's works, *The Financier* (1912) and *The Titan* (1914), described speculation and graft in high places, with no apparent interjection of the author's own opinions. In *An American Tragedy* (1925), Dreiser allowed a protagonist to be driven to murder by sheer solitude, a need to please, and social circumstances, thus shifting blame for a crime on society itself. E. L. Masters, through a series of imaginary epitaphs in the *Spoon River Anthology* (1915), criticized life in a small American town. Masters's works mark the beginnings of modern poetry in a realistic vein similar to Dreiser's sombre vision, bringing to the fore a sense of unease already evinced by Mark Twain and Henry James at the beginning of the century.

After the First World War, American novelists noted that nothing had changed for the better. Values crumbled and money reigned supreme. Shallow-rooted religion indulged in sterile hypocritical gestures to ensure social ascension. The prevailing puritanism hardly cloaked widespread soulless lust and unbridled violence. Prohibition merely whetted society's thirst for alcohol and swelled the

pockets and power of the mobsters. The belief in a democratic dream of opening doors to a new world was criticized by some and cultivated by others.

James T. Farrell's trilogy (*Studs Lonigan*, 1932–35) dealt with the Irish Catholic urban poor living on the wrong side of the tracks. On a spree from one bar to another, Farrell's main character here goes on a 'nostalgic' and useless personal quest, if only to redeem himself in his own eyes. As with Dreiser's writing, Farrell's approach was naturalistic and precise with abundant detail. Although F. Scott Fitzgerald's world was peopled with the wealthy and was perhaps more subtle, he nevertheless also described desperate social climbers, caught in meanders of their own making (*This Side of Paradise*, 1920), corrupted by drink and incest or utterly paralyzed with cowardice (*The Great Gatsby*, 1925) (Plate 137).

Similar despair haunted the autobiographical novels of Thomas Wolfe, another realist in the Dreiser vein, whose style also showed a strong lyric touch (*Of Time and the River*, 1935). Sherwood Anderson scathingly described the suffocation of youthful dreams of freedom in small-town life, as in *Middle West* and *Winesburg, Ohio* (1919). The anonymous, stereotyped small town with its cast of drab characters also featured in the satirical novels of Sinclair Lewis (1930\*), such as *Main Street* (1920) and especially *Babbit* (1922), whose title character became a universal symbol of the average American. Lewis also denounced bogus preachers (*Elmer Gantry*, 1927), budding fascism (*It Can't Happen Here*, 1935), and racism (*King's Blood Royal*, 1947). The writing of Southern gentleman William Faulkner (1949\*) belonged to the tradition of realism, but with sombre allegory darkening his almost macabre fiction (*The Sound and the Fury*, 1930). Faulkner denounced the legacy of slavery and believed that the solution would have to come from an act of love on the part of the South. Only suffering might make up for past inflicted pain (*Intruder in the Dust*, 1948). Faulkner's fiction won universal acclaim. Indeed, the multiplicity of its narrators, sites, time frames, and characters, would even come to influence the *nouveau roman*. Perhaps somewhat like Malraux in France, Ernest Hemingway (1954\*) cultivated a heroic male image through war journalism: an image which might impart a meaning to life over and beyond existential despair. Again like Malraux, Hemingway portrayed Republican Spain and its struggle against fascism (*For Whom the Bell Tolls*, 1940). In *The Old Man and the Sea* (1952), Hemingway turned towards more symbolic writing. In general, Hemingway aimed for the purified 'right phrase', rising like the tip of an iceberg to suggest the mass below, to borrow the writer's own metaphor.

The fictional trilogy by John Dos Passos, *U.S.A.* (1930–36), wove together newspaper clippings, snatches of popular song and snippets of biography and poetry. Dos Passos denounced war and its hidden cogs and wheels and generally deplored modern society; his almost photographic eye depersonalized characters, nearly reducing them to mechanical toys played upon by chaotic forces. His *U.S.A.* later inspired a trilogy by Sartre, who considered Dos Passos 'the most important writer of the century'. Henry Miller, another critic of modern society, and especially American society, composed an expressionist, lyrical body of work very different from the writings of Dos Passos. Miller attacked all Western values, whose hypocrisy and puritanism he condemned in the name of freedom. He denied, however,

responsibility for the sexual revolution that later shook America. But the fact remains that his chief works, including *Tropic of Cancer* (1934), *The Air-Conditioned Nightmare* (1945), and *The Rosy Crucifixion, (Sexus, Plexus, Nexus,* 1949–60), were all banned in the United States until 1961.

Modern American verse experienced a sudden flowering in Chicago from 1912 onwards, with the literary journal *Poetry*, which for the next half-century published a wide variety of works. Twentieth-century American poetry showed no homogeneity whatsoever. It refracted, at a distance, the influence of Ezra Pound, an expatriate in Europe since 1908. Pound's lessons included economy of language, the 'direct' approach, and special attention to rhythm. But these lessons might be combined with the most divergent tendencies: some poets broke with tradition, others were keen to maintain it; and where some writers of verse evoked only a city or region, others sought to render the spirit of an entire nation, or themes of universal importance. Carl Sandburg spoke of Chicago, then of the United States (*Chicago*, 1916; *The People, Yes*, 1936), and Robert Frost pondered the landscape of New England. Around 1955, there arose a new school of poetry, surrealist and even dadaist in inspiration, generally read aloud, with jazz music in the background, in the San Francisco bars frequented by the Beats. Allen Ginsberg's incantations (*Howl*, 1956) reproduced the slang, violence, and rawness of the drug culture.

Eugene O'Neill (1936*) was arguably the most outstanding representative of twentieth-century American theatre. He greatly contributed as of 1916 to free the stage from Broadway 'commercialism'. Influenced by Greek tragedy, Shakespeare, Strindberg, German expressionism, Nietzche, and Freud, O'Neill wrought highly original drama. His characters, weak creatures buffeted by a blind, cruel world, can neither reform, nor communicate with one another (*The Emperor Jones*, 1920; *Anna Christie*, 1921). Towards the end of his life, O'Neill revealed more of himself in plays in an autobiographical vein (*A Long Day's Journey into Night*, 1956). After the Second World War, Tennessee Williams staged erotic and violent neuroses (*A Streetcar Named Desire*, 1947). Arthur Miller's plays symbolize political persecution with characters victimized by their convictions in a pitiless American environment (*Death of a Salesman*, 1949; *The Crucible*, 1953) (Plate 138). In reaction against Broadway, then Off-Broadway, a new, Off-Off-Broadway theatre cropped up. This dramatic genre was a continuation of the Beat movement, and revealed inspiration from Dada, Artaud, and even Zen Buddhism, traces of all of which can be detected in the plays of Bob Wilson, which feature much music and dance (the opera composed by Philip Glass, *Einstein on the Beach*, 1976). David Mamet's experimental theatre dwelt on the city of Chicago, with two or three characters (*Duck Variations*, 1971; *Edmund*, 1983). Sam Shepard's later plays, very much in the American grain, devoted attention to family plights (*Curse of the Starving Class*, 1976; *True West*, 1980; *Fool for Love* 1983).

The period after the Second World War saw the appearance of many autobiographical novels. Black novelists were eager to testify to the black experience in America. Richard Wright's *Black Boy* (1945) showed crime as the only choice available to a black youth in a white world (Plate 139). In *The Invisible Man* (1952), Ralph Ellison traced the searing progress of an unnamed individual literally forced by society into the ground. But while a given black individual might bear witness to a particular condition, still, he or she was made to speak on behalf of a broader human vision, as in Ellison's writings and, again, in the works of James Baldwin. Later writers, in works even more symbolic than Ellison's, explored the problems of literary art as such, or issues with less overt links to political activism, as was the case with *Tar Baby* (1981) by Toni Morrison (1993*), which dealt with a black woman's lot.

Such a shift has, indeed, been apparent in American literature in general. Social realism is everywhere being replaced with fantasy or the outright fantastic, with symbolism, philosophical or moral reflections, or the quest for love. An urban tradition tinged with Jewish humour is very visible in such important novels by Saul Bellow (1976*) as *The Adventures of Augie March* (1953) and *Herzog* (1964), or in the fiction of J. D. Salinger (*Catcher in the Rye*, 1951; *Franny and Zooey*, 1961). In this tradition again were the profoundly humane works of Isaac Bashevis Singer (1979*) written in Yiddish. Singer evoked the Jewish legends of the Polish ghettoes, and the successive waves of Jewish immigration to the United States (*Shosha*, 1978). For his part, Nabokov, first a Russian writer, then an Anglo-American one, but always with a distinct European flair, limned American realities with distant, ironic wit (*Lolita*, 1955; *Pale Fire*, 1962). In *Ada or Ardor: A Family Chronicle* (1969), Nabokov related the amorous episodes of a couple adrift in a world of dream and fantasy. Both William Gass and John Barth (*Lost in the Funhouse*, 1968) ironically toyed with narrative patterns, breaking them up into bewildering fragments with reflections on writing itself. American post-modern trends were mostly spurred by distaste for realities falsified by politics and the media, which gave rise, by way of reaction, to the 'unreal', surrealistic, and even dadaistic jeering of so many writers. Such discredit cast upon outside 'reality' provoked authors such as Robert Coover to inveigle the reader into confronting different possible outcomes for the same erotic scene. In one of his latest novels, *Pinocchio in Venice* (1991), the many levels of significance of Coover's plot follow the adventures of the famous half-real, half-fantastic puppet, as a tale of initiation where the strings and temptations of society prevent the poor creature from fulfilling his total human potential. At the dawn of the twenty-first century, a number of writers were using global electronic networks. Thus the poet and novelist John Updike (*Midprint*, 1969; *Hugging the Shore*, 1983) opted for interactive literature, and initiated an 'exquisite corpse' in partnership with 18,000 internauts.

## Canada

One of the distinctive characteristics of anglophone Canadian authors is their quest for identity against the backdrop of their vast and sometimes overwhelming natural environment. One of the most famous Canadian poets, E. J. Pratt, transformed the construction of the transcontinental railway into a song with epic overtones (*Towards the Last Spike*, 1952). The many poets who succeeded him (more than a thousand collections were published in the 1960s alone) often expressed, in modern forms, their attachment to the region, the prairies in particular, and the great outdoors. In his autobiography, *In Search of Myself* (1921), and in his novel *Over Prairie Trails* (1922), Frederick Grove evoked the vast expanses of Saskatchewan, in his reflections

on the human condition. Emily Carr wrote of her life among the Indians of the poverty-stricken villages of British Columbia (*The House of Small*, 1942), and then of her Victorian childhood (*The House of All Sorts*, 1945). Sheila Watson described the mountains of western Canada, dealing with the same themes as Carr, but with an art that transcended regionalism (*The Double Hook*, 1959). Numerous writers, especially Michael Ondaatje, with his poetic novel *In the Skin of the Lion* (1987), chose Ontario and the city of Toronto as their subject. In *Two Solitudes* (1945), Hugh MacLennan deplored the divide between French and English Canadians and, in a science fiction style, suggested a brighter future in the form of a marriage (*Voices in Time*, 1980). Margaret Lawrence's characters tried to take stock of their lives in an attempt to find some meaning in them (*The Stone Angel*, 1964). Malcolm Lowry, in his famous novel *Under the Volcano* (1947), set in Mexico, evoked Canada (British Columbia) as an earthly paradise. In *The Piano Man's Daughter* (1995), Timothy Findley painted the portrait of a Canadian family in Ontario from the nineteenth century to the Second World War. He showed with the utmost sensitivity how its members were gradually sapped by hereditary madness. The author of many novels, including *The Wars* (1977) and *Famous Last Words* (1981), Findley is widely considered one of Canada's finest writers.

The lyrical poetry of Fernand Ouellette has been highly praised in Canada and Europe alike (*Tu regardais intensément Geneviève*, 1978). To this day, francophone Québécois authors continue to feel kinship with three cultures – French, Canadian, and North American, but with a sense of alienation from all three. Rina Lasnier's poetry expressed the stifling solitude she felt as an artistically gifted child (*Madonnes canadiennes*, 1944; *Les Gisants*, 1963). The cultural revolution that swept Québec in the 1960s produced a great crop of writers, including many women who denounced all forms of alienation, including those imposed by a male-oriented language. Québécois authors claimed full liberation of the body, perceived as the site of a daily experience of the senses but one that could yield keys to metaphysical dimensions. Rejection of political and social structures and confines found expression through a wide spectrum of literary activity in the crafting of novels-within-the-novel, exploration of form, marginal writings, and sheer manipulations of language with spurts of parody and punning as with Jean Daunais's *Les Douze coups de mes nuits* (1979) and especially works by Réjean Ducharme, who explodes language in his novels (*Le Nez qui Voque*, 1967; *Les Enfantômes*, 1976). Ducharme's last works (*Dévadé*, 1990; *Va savoir*, 1994) confirmed him as one of Quebec's finest novelists. A recurrent theme in all of his works is a rejection of all constraints. A similar vein can be found in the work of many poets. Like their European counterparts, Québécois authors in the 1980s paid closer attention to problems of identity. The protagonist in *Volkswagen Blues* (1989) by Jacques Poulin, for example, searches the length and breadth of the United States for his roots. Revolt, violence and death are never far away in Anne Hébert's novels; and incest, symbolizing an oppressive Church and an unacceptable colonization, is a major theme in her work as late as 1975. In *Les Enfants du sabbat*, a nun becomes the very incarnation of ecclesiastical witchcraft. Marie-Claire Blais described the material poverty and spiritual emptiness of human beings, the theme of love and impossible

communication, and – like so many authors – death as often the only existential solution left (*Une Saison dans la vie d'Emmanuel*, 1965; *Vision d'Anna ou le vertige*, 1982). Michel Tremblay's output includes more than forty works (*Chroniques du plateau Mont-Royal*, 1989–95), and his plays rank among the best on international stages today (*Les Anciennes odeurs*, 1981; *Albertine en cinq temps*, 1984). Much in the manner of Latin American authors, French-Canadian writers of novels and short stories have been going back to their cultural roots to add a 'magic' dimension to the realism of their fiction.

## West Indies

Martinique's Aimé Césaire raised a poetic cry in three 'acts' in *Cahier d'un retour au pays natal* (1939), denouncing both the physical and moral wretchedness of the islands and the boasted 'reason' of the West, which made the poet prefer the madness of the wretched. Haiti's poet Jacques Roumain (*Gouverneurs de la rosée*, 1944) mourned the misery of oppressed peasants on his island, but glorified blacks in general, a theme taken up by his countrymen Jacques-Stephen Alexis (*Compère Général Soleil*, 1955), who was assassinated by the Haitian regime, and René Depestre (*Etincelles*, 1945; *Bonjour et adieu à la négritude*, 1980). In broken language, mingling dreams and fact, another poet of Martinique, Edouard Glissant (*La Lézarde*, 1958; *Malemort*, 1975), told of slavery and aborted revolts. In the neighbouring English-speaking Caribbean islands, Derek Walcott (1992*), born in Saint Lucia, founded a theatre in Trinidad which, until 1988, staged his plays, which were praised as brilliant reflections of the Caribbean's cultural diversity (*Dream on Monkey Mountain*, 1970; *The Odyssey*, 1992) (Plate 140). Walcott's widely known verse (*In a Green Night*, 1962; *The Arkansas Testament*, 1987; *Omeros*, 1990) skilfully blends English with Creole.

## Spanish-language literature in Latin America

Nicaraguan poet Ruben Darío, the very soul of the Iberian world's modernist movement, renovated the expressive powers of the Spanish language and enhanced Latin America's contribution to world literature. After the publication of Darío's last work, *Canto a la Argentina y otros poemas* (1914), Spanish-language literature addressed a larger audience and dealt with social problems. With writers of the stature of Argentina's Jorge Luis Borges, the reputation of Latin American letters became truly international (Plate 141).

Still, as his lyrics on Buenos Aires and Argentina in *Cuadernos de San Martin* (1929) showed, Borges's work remained deeply rooted in its own paradoxically complex Latin American reality and culture. At the same time, the increasingly cosmopolitan and universal-minded Borges relied on numerous foreign influences (*Discussión*, 1932), notably Germanic mythology and literature. The lonely, blind Argentine author who was incessantly solicited to give lectures around the world after the Second World War, rejected all labels and religions, except that of literature. He explored all literary genres and readily blended them. Through his self-defined 'polyphonic' fiction, Borges set out 'to change the faculty of imagination.' *El Aleph* (1949)

earned him the reputation of a metaphysician. His disquieting stories, laced with elements of the fantastic, have never left readers indifferent (*Ficciones*, 1941–44; *El libro de arena*, 1975). His ironic distance and scepticism regarding all systems have earned him the disapproval of some critics, but most recognized Borges as a committed and authentic humanist.

In neighbouring Chile, Gabriela Mistral (1945*) wrote compassionate verses on the condition of children in distress, while her countryman, Pablo Neruda (1975*), attained worldwide fame. In intimate texts inspired by surrealism, Neruda expressed anguish and solitude (*Veinte poemas de amor y una canción desesperada*, 1924), probed the meaning of life (*Residencia en la tierra*, 1933–37) and became involved in the struggle against Franco and dictatorship in all its manifestations (*España en el corazón*, 1938). His *Canto general* powerfully evoked the soil, its human inhabitants and native animals, the very life of the new continent, while denouncing the oppression and exploitation of its peoples by the conquerors. Cuba's Nicolás Guillén also protested against the Franco regime, returning to live in his homeland after the Castro revolution. Peruvian poet César Vallejo, in his *Heraldos Negros* (1918), dwelt on the confusion of blacks faced with a hostile world, which both eluded and excluded them; in his *Nada*, a disillusioned individual apprehends pantheism through transcended pain. Vallejo's Marxist- and surrealist-inspired *Poemas humanos* (1939) expressed his love for the animate and inanimate. Chilean poet Vicente Huidobro turned away from imitations of nature to 'create' instead (*Creacionismo*). He also drew on European avant-garde influences to blend with Latin American narrative material in his novel, *Mio Cid Campeador* (1929). In 1931, Huidobro published his greatest poem, *Altazor o el viaje en paracaidos*. Mexico's José Gorostiza pondered existential problems and life and death in *Muerte sin fin* (1939), dislocating language to the point of destruction.

Latin American novelists turned their attention to the great indigenous myths and to pressing social issues. In *La Vorágine* (1924), Colombia's José Eustacio Rivera described his homeland's mighty, violent forests, with which human beings had constantly to contend. This work in turn inspired the highly successful novel *Doña Barbara* (1929), by Rómulo Gallegos, Venezuela's president in 1948. Rich in local colour, *Doña Barbara*, set in the Venezuelan *pampa*, features a ferocious individual who devours every corrupt surrounding creature, a symbol of avenging justice over barbarism. Guatemala's Miguel Angel Asturias (1967*) dealt with Mayan mythology or with individuals in search of their identity, while satirically castigating dictators and denouncing exploitation by foreign firms (*El señor presidente*, 1946; *Hombres de maíz*, 1949; *El papa verde*, 1954). Asturias's *Maladrón* (1969) related in a style known as 'magic writing' the ancient quest for an ocean passage between the Atlantic and the Pacific: an exuberant pretext for religious or humanistic discourse, packed with passages of sheer delirium. Cuba's Alejo Carpentier, much like Asturias, approached whatever 'reality' he described from multiple perspectives and with many magical digressions – landscapes, characters, etc. – as in his masterpiece, *El siglo de las luces* (1962). Carpentier also penned the mordant character sketch of a dictator in *El recurso del método* (1974). Mexican poet Octavio Paz (1990*) first drew his inspiration from the surrealists, then turned to the Far East. Love and

freedom are the subjects of his *Piedra de sol* (1957) and *Ladera Este* (1962–68). The force of poetic imagery, according to Paz, should be able to leave its unsettling imprint in many contexts, even on social revolution: a point stressed both in his poems (*Libertad bajo palabra*, 1949) and in his essays (*El arco y la lira*, 1956; *Las peras del olmo*, 1965; *Conjunciónes y disyunciónes*, 1969). *Laberinto de Soledad* (1950), with its meditations on the human condition and the world, established Paz's international reputation. His last collections of verse, such as *Corriente alterna* (1967) and *El fuego de cada día*, continued to reflect Paz's concerns with Mexican identity.

While the Dominican priest Pedro Henríquez Ureña helped capture one definition of Latin American identity (*Ensayos en busca de nuestra expresión*, 1928–52), Mexico again, its spirit and people in the throes of poverty and revolution, provided the main themes for the fiction of Mariano Azuela (*Los de abajo*, 1916; *Los caciques*; *Pedro Moreno*; *El insurgente*), the author, philosopher and statesman José Vasconcelos (*La raza cósmica*, 1925), and Juan Rulfo (*El llano en llamas*, 1953; *Pedro Páramo*, 1955). Mexico's Carlos Fuentes stripped off society's hypocritical mask (*Los días enmascarados*, 1954), trounced self-serving revolutionaries who betrayed their cause (*La muerte de Artemio Cruz*, 1962), and pondered the issue of identity in yet another major novel, *Terra nostra* (1975). Attempting to uncover what history most often cloaks, Fuentes experimented with language and the techniques of fiction, including the *nouveau roman*, often resorting to interior monologue. His essay 'La nueva novela hispano-americana' explains his distinctive approach to literature

Peruvian national identity was examined by José Carlos Mariátegui in many works such as those collected in his influential *Siete ensayos de interpretación de la realidad peruana*, first published in 1928 and still popular today. José María Arguedas described the gap between rich white landowners and the Indians whose culture he lovingly described (*Yawar fiesta*, 1941). *Los ríos profundos* (1958) told of the Indian revolt and the ensuing white repression, while modern Peru appeared overwhelmed by its problems in *Todos los sangres* (1964): indeed, in despair over the endless struggle between dominant whites and oppressed Indians, Arguedas committed suicide in 1969. Mario Vargas Llosa unveiled the secrets of smug Lima society under the Odria dictatorship in *Conversación en la catedral* (1970). After writing *La Guerra del fin del mundo* (1983), he turned to Latin America's most pressing issues as summarized in his collection of essays, *Contra viento y marea III* (1990).

In Argentina, Julio Cortázar employed 'magic realism' with cosmopolitan adventures and daily happenings at once disquieting, baffling, and fantastic, thus exploring the mystery of human nature (*Libro de Manuel*, 1973). Cortázar's *Rayuela* (1963), a half-serious fictional labyrinth, left the succession of chapters to the reader's discretion, along with a medley of essays, poems, and short stories. Manuel Puig explored the yearnings and sensitivity of two homosexual prison inmates in *El beso de la mujer arana* (1979).

Colombia's Gabriel García Márquez (1982*), in his extraordinary epic novel *Cien anos de soledad* (1967), harnessed every trend in Latin American literature, coupling ancestral myth with brutal present-day social reality: through an individual's solitary and magical quest for a lost paradise (Plate 142).

## Brazilian literature

In Brazil, São Paulo's Modern Art Week sparks off effervescent literary activity. With a variety of formal innovations of European inspiration, poets and novelists gradually developed a specifically Brazilian brand of literature. Leading writer Oswald de Andrade drew on the prose of the early Portuguese chroniclers for the subject matter of his collection of poems *Pau Brasil* (1925). Another modern poet, Mário de Andrade, depicted a multiracial Brazil where Indian and African mythology mingled through the ages in a language as composite as the multi-cultural country itself (*Macunaíma*, 1928). This poem in turn greatly influenced João Guimarães Rosa, whose regionalist evocations of the *sertão* or 'interior', the country's desiccated north-east region, through the poetic language of his *Grande sertão: Veredas* (1956), continued to stress a major theme of Brazilian literature. In works by Guimarães Rosa, dwellers of the *sertão* – children, peasants, old blind men – tell their life-stories to an invisible narrator. The *sertão* was already the main feature of Garciliano Ramos's *Vidas secas* (1938), where poverty-stricken families flee the arid interior for the beckoning mirage of the seemingly opulent coast. Raul Bopp's *Cobra Norato* (1928–31), a fable in free verse incorporating myth, further defined the emerging Brazilian reality. Satire found its finest expression in the works of Alcântara Machado (*Brás Bexiga e Barrafunda*, 1927), and again with Ramos who condemned the 'cannibals' of the new bourgeois class (*Caetés*, 1933). After 1930, both fable and satire combined in Jorge Amado, a poet deeply rooted in the past of his native north-east region, with its suffering mulatto population (*Cacau*, 1933; *Mar morto*, 1936). Amado described his country with humour but with great tenderness as well (*Teresa Batista cansada de guerra*, 1975; *A America descoberta pelos Turcos*, 1992), while contemplating the future with optimism (*Camisola de dormir*, 1980). Rapid urbanization has caused writers of fiction such as Rubem Fonseca (*Zona sul*; *Feliz Ano Novo*, 1975) and Marcelo Rubens Paiva (*Agosto*, 1990; *O selvagem da Opera*, 1994), to cast a rather baleful eye on the possibilities of picaresque adventure in Rio de Janeiro's urban jungles.

## AFRICA AND THE NEAR EAST

### North Africa

Many Algerian authors, such as Jean Amrouche and Kateb Yacine (*Nedjma*, 1956), have written in French even though the protagonist in Yacine's novel symbolically rejects his foreign spouse to search for an ancestral and virginal Algeria. Mohammed Dib's distinguished work extends over half a century. Like the writing of Amrouche and Yacine, Dib's trilogy, *Algérie* (*La Grande Maison*, 1952; *L'Incendie*, 1954; *Le Métier à tisser*, 1957), claimed the right to a 'new soul' on behalf of the many social classes making up Algeria's colonized population. In 1962, Dib shifted his approach to fiction and wrote in poetic terms of the sea as a symbol of renewal and permanence. Independence brought other issues to the fore. By 1968, Dib was speaking out against official conformism and lies, while Rachid Boudjedra denounced the structure of the traditional North African family (*La Répudiation*, 1969). Nabile Farès deplored 'the

exile within our own souls' (*L'Exil et le désarroi*, 1976) and Rachid Mimouni condemned a ruling and corrupt bourgeoisie and bureaucracy (*Le Fleuve détourné*, 1982). Nouredine Aba's plays staged a drama of protest, and Aïssa Khelladi described an atmosphere of terror, suspicion, and secret informers in contemporary Algeria (*Peur et mensonge*, 1996). Dib's latest work similarly depicted a country village with its groves, hills, memories, aspirations, and present distress under siege by bloodthirsty, cut-throat 'mad dogs' (*Si Diable veut*, 1998). In addition, more than 34 Algerian women writers have examined the question of women in their society since 1947. Like so many other literate North African women, Assia Djebar regarded the French language as an instrument for liberation (*Les Alouettes naïves*, 1967; *Ombre sultane*, 1985).

French-language Moroccan authors also addressed the contrast between tradition and modernism, with various claims, protests, and quests for identity. By 1954, Driss Chraïbi was attacking paternal authority and an ossified Islamic tradition (*Le Passé simple*), but he also denounced the condition of migrant Moroccan workers in France (*Les Boucs*, 1955) and further probed East/West or traditional/modern contrasts in his quest for absolute values (*Naissance à l'aube*, 1986). Mohammed Khaïr-Eddine's novels are a fantastic medley of prose, verse, and theatre (*Le Déterreur*, 1973), while Abdellatif Laâbi considered the past dead and sought fresh identity and purpose (*L'Oeil et la Nuit*, 1969; *Le Chemin des Ordalies*, 1975). Driss Chraïbi took up similar themes (*Mort au Canada*, 1975). Tahar Ben Jelloun's very poetic novels brought to light the ambiguous sexuality of lost souls (*La Nuit sacrée*, 1987) and expressed the most intimate thoughts of an old man abandoned by all (*Jour de silence à Tanger*, 1990).

After 1950, Tunisia's significant writing in French was principally represented by the autobiographic works of Jewish writer Albert Memmi. In *Statue de sel* (1953) and *Le Scorpion* (1969), Memmi pitted the colonized subject against the colonizer, but also stressed the need for the colonized subject to undergo searching self-criticism as well: self-satisfaction would never do because 'rejection of self' was also a requirement for liberation. In fact, many North African authors, in a state of 'abiding frustration', concluded that their enemy was not only the colonial ruler, but themselves as well. This realization gave rise to the fresh perspective of the new novelists, short-story writers and poets of the 1980s on social upheavals, on themselves, and on the Other, while searching farther afield to raise issues of universal significance. The young Tunisian writer Emna Bel Haj Yahia recounted the efforts of two women to find their place in a would-be modern society still ruled by the laws of the Koran (*Chronique frontalière*, 1991). Like the literary output in French, the number of new novels in Arabic in independent North Africa began to rise steadily, despite what some perceived as a religious taboo on using the form 'I' in writing: hence the theoretical impossibility of writing an autobiography in Arabic.

In neighbouring Egypt, Arabic was certainly being used for realistic fiction in the wake of Muhammad Husayn Haykal's *Zaynab* (1914). In 1930, Haykal published his autobiography, *Al-Ayyâm (Days)*, in classical Arabic. Haykal is regarded as one of the greatest contemporary writers in the Arabic language. In his novel *The Damned of the Earth* (1949), he describes the plight of the unfortunate men who see the 'tree of poverty' grow in their fields. Tawfiq

al-Hakîm wrote plays on themes inspired by ancient Greek mythology before turning to more modern themes without eschewing dreams and the irrational; he became famous for his novel *Journals of a Rural Assistant District Commissioner*, in 1937. By 1955, Haykal was championing women's rights. The novel as such, then emerging from under the shadow of European influences, took firm root in Egypt. Abdel Rahman al-Sharqawi's realistic tale *The Earth* (1954) described the oppression and misery of Egypt's children of the soil. Naguib Mahfouz (1988*) brought to life Egypt's capital city in his Cairo trilogy (1956–67), which brought him international fame and established the originality and universal importance of contemporary Arabic literature. Mahfouz has written more than forty novels and short stories. His most controversial novel, *The Children of Gebelawi* (1959), stressed the link between the three great monotheistic faiths. Mahfouz explored fresh paths in *Miramar* (1987). Young novelists who followed the literary trail blazed by Mahfouz, but with sensitivity for new forms all their own, included Edouard al-Kharrât, Sonallah Ibrahim, and Nabeul Na'hum.

## The Near East

In Lebanon, the poet Adonis ('Ali Ahmad Sa'id) made a clean break with the Near Eastern poetic tradition by composing verses in a surrealistic vein, drawing on a tradition partly inspired by Walt Whitman's poetry. This highly nostalgic poetry is known as poetry of exile (*mahjar*) as it is mainly written by Lebanese refugees in Egypt, like Mikha'il Nu'aima and Gibran Kahlil. The renowned Iraqi poet Nazik al-Mala'ika relies on classical Arabic metres for the rhythm and music of her verse, while addressing new themes, such as her hopes for improving the condition of women. The Middle East conflict was central to the politically *engagé* novel of the Palestinian writer Ghassan Kanafani (*Men in the Sun*, 1963), and *The Secret Life of Saeed the Pessoptimist* (1974) by Emile Habibi relates with bitter irony the life of an Arab living in Israel who finds nobody to listen to him but beings from outer space. The celebrated Palestinian poet Mahmoud Darwish in turn reflected present-day political concerns. In *Why Have You Left The Horse Alone?* (1994), Darwish searches for a national identity through writing.

In the region that would become the State of Israel, writers who published in Hebrew after the 1920s were for the most part immigrants. S. Y. Agnon (1966*) is considered the first great author of modern Israeli literature for his witty and bittersweet tales of Jerusalem, as well as for his evocation of the Holocaust. A new generation of authors rejuvenated writing styles to deal with the changes and psychological, economic and political problems of Israeli society. Avraham B. Yehoshua's portrait of this society was both realistic and ironic in *Molkho Five Seasons*, 1989. In *Mr. Mani*, 1990, Yehoshua invented a series of father-to-son dialogues from 1880 to the present. Amos Oz showed how proximity could engender conflict between neighbours, but also created the needed links for peace (*Voices of Israel*, 1982). Oz's *Black Box* (1987) explored the contrasting feelings of love and hate between two human beings. The country's current crop of writers, sometimes called 'the generation of normalization', dwells on problems pertaining to the issue of coexistence, while most Israeli authors find themselves swept along by the leading international literary trends. David Grossman's characters, maddened by sullied and violence-ridden realities, escape into imaginary worlds (*The Smile of the Lamb*, 1983). In Grossman's *See Under: Love*, 1986, two survivors of the Nazi death camps refuse to discuss the matter while their son carries on an obsessive investigation.

In Turkey, after the liberation of the language by the poetry of Nazim Hikmet (who was in turn influenced by the works of Mayakovsky) from the 1950s onwards, numerous writers of peasant origin related the evolution and modernization of social structures in Anatolia. *The Lords of Akçasaz* by Yasar Kemal is the best example. In *Kara Kitap* (*The Black Book*, 1990), Orhan Pamuk used Joycean form to describe someone searching for his identity in Istanbul, a city of snow and slush, mysterious and laden with its past, and yet very close to Europe. In Iran, after Hejazi's combative prose and novels of love and mores, and the familiar stories of Jamalzade, the realist novellas of Sadeq Hedayat describe the problems of Persia after 1941. Hedayat has strongly influenced all contemporary Persian writers.

## Sub-Saharan Africa

As in the Maghreb, writers in sub-Saharan Africa have focused on several themes: exorcizing the legacy of colonialism and racialism, reasserting cultural identity particularly in relation to the West, denouncing domestic political or economic oppression, and seeking a new language. All these elements might, quite simply, be taken to define Negritude, a blanket term covering the ethical and cultural claims made by pioneer black francophone poets on African soil, in the Caribbean and in the Indian Ocean region. French Guyana's Léon Damas published the first collection of verse of the Negritude movement, *Pigments*, with a preface by Robert Desnos in 1937. Damas's poetry celebrated black revolt against exploitation and humiliation, with flashes of wit, profound tenderness and nostalgia for a mythical Africa. Madagascar's Jean-Joseph Rabearivelo drew on oral sources to express his people's anguish in modern terms (*Traduit de la nuit*, 1935), while his private diary, *Cahiers bleus*, bore witness to Malagasy conditions on the eve of the Second World War.

Senegal's Léopold Sédar Senghor felt less bitterness towards France than had Aimé Césaire and dwelt on childhood memories transfigured through a past of legends and magic (*Chants d'ombre*, 1945). Other Africans publishing in French included Birago Diop, who borrowed from the traditional griots or storytellers to describe the realities and values of village life in the West African Sudan (*Les Contes d'Amadou Koumba*, 1942); and Djibril Tamsir Niane, who did the same for the Mandingo people (*Soundjata ou l'Epopée mandingue*, 1960), while Amadou Hampaté Bâ safeguarded and transcribed the legacy of the Fulani or Peul people (*Amkoullel, l'enfant peul*, 1991), and Sory Camara related the tales of the Malinké griots (*Gens de la parole*, 1976). Nigeria's John Pepper Clark proceeded along similar lines to render in English the mythic feats of the hero of the Ijo people, in *The Ozidi Saga* (1977).

Senghor was succeeded by other poets of protest. Senegal's Sembene Ousmane described a strike against colonial racialism and administrative corruption (*Les Bouts*

*de bois de Dieu*, 1960). Cameroon's Ferdinand Oyono exploded the myth that a colonizing power felt any special gratitude towards colonized subjects (*Le Vieux Nègre et la médaille*, 1956). Also from Cameroon, Mongo Beti attacked the incurable gangrene of colonialism with corrosive wit, in *Le Pauvre Christ de Bomba* (1956). He later went on to ridicule contemporary African power brokers (*La Ruine presque cocasse d'un polichinelle*, 1979; *Les Deux mères de Guillaume Ismaël Dzewatama*, 1983; *La Revanche de Guillaume Ismaël, Dzewatama*, 1984). Coming after Senghor and Césaire, the brilliant Mauritian poet Edouard Maunick panned ideas like gold dust through the sieve of the French Creole speech of his luxuriant island homeland (*Paroles pour solder la mer*, 1988; *Anthologie personnelle*, 1989). Very different verse was written by one of Africa's leading poets, Congo-Brazzaville's Tchicaya U'Tamsi (*Mauvais sang*, 1955; *Le Ventre*, 1978), in clashing syntax, with harsh music and violent imagery. *L'Enfant noir* (1953), by Guinea's Camara Laye, a story of idealized childhood, might be compared with Senghor's *Chants d'ombre*. *L'Aventure ambiguë* (1961), by Senegal's Cheikh Hamidou Kane, is a profound meditation on the successive phases of acculturation among his Diallobé people through the clash between two civilizations. On his return to his homeland, Kane's protagonist, torn between impossible choices, can no longer live. Kane further denounced the alienation of contemporary human beings as a result of the consumer society and prophesized the West's self-destruction.

*The Palm-Wine Drinkard* (1952), by Nigeria's Amos Tutuola, played astonishingly with English. In the wake of Tutuola's achievement, Chinua Achebe's work skilfully showed how English might be fully put to African purposes and thereafter enjoyed great influence. Achebe's fiction (*Things Fall Apart*, 1958; *No Longer at Ease*, 1960; *A Man of the People*, 1966), and verse (*Beware, Soul Brother*, 1972) described the destruction of village society by missionaries and corrupt politicians. In *Anthills of the Savannah* (1987), Achebe resumed his meditation of his country's history by setting the proverbs of the Igbo people against the slogans of politicians. Wole Soyinka (1986*) (Plate 143) used English in his verse, but in his drama mingled Yoruba with the most polished English (*Death and the King's Horsemen*, 1975).

The novels by Kenya's Ngugi wa Thiong'o (*A Grain of Wheat*, 1967; *Petals of Blood*, 1977) attack corrupt government officials and exploitative foreign investors in his homeland. His works are written in English and interwoven with chants in Gikuyu and Kiswahili. Ngugi's spoken play in the Gikuyu language, *Ngaahika Ndeenda* (1982), was banned by the authorities. In Somalia, when Nurudin Farah's novel in his mother tongue was banned, the author went into exile and began writing in English. Nigeria's leading human-rights activist Ken Saro-Wiva, who was executed in 1995, resorted to a 'rotten language', mixing pidgin with English, the better to reflect the dislocated and dissonant society of his protagonist (*Sozaboy*, 1987). The Kiswahili language completely replaced English in Shaaban Robert's *Kusadikika* (1951) and *Insha ya Mashairi* (1967). When Kiswahili became the official language of the United Republic of Tanzania, most writers, indeed, turned away from English. Euphrase Kezilahabi deplored rural emigration, poverty and the problems of his country's youth (*Dunya Uwanja wa Fujo*, 1975). But such attempts to recover their national language could turn against authors

who denounced the shortcomings of their own new ruling social class, while failing to secure a large foreign readership. In Zimbabwe, Chenjerai Hove published *Bones* (1988) in English, but stressed 'the power of the people' in *Masimba Avanhu* (1986), written in his own Shona tongue. David Yali-Manis presented texts (1977) in Xhosa, in order to transcribe the spontaneous oral poetry known as *isibongo*. Zulu poet B. W. Vilakazi mixed *isibongo* with Western-inspired verse. After pioneering African novelist Thomas Mofolo published *Chaka* in 1925, a work in the Suto language, the conflict between the Zulu and the British was again described in this same tongue by B. M. Khaketla.

South Africa's Nadine Gordimer (1991*) (Plate 136) related the suffering of individuals caught up in the clashes of apartheid. Gordimer chose to struggle against racialist oppression and on behalf of reconciliation between her country's ethnic groups (*July's People*, 1981). Her novel denounced the violence of a modern society where firearms might be procured at will. Deep-probing descriptions of violence with J. M. Coetzee (2003*) became truly nightmarish (*Waiting for the Barbarians*, 1980). D. M. Zwelonke pondered the dichotomy between unavoidable outside reality and the fiction intended to portray it. South Africa's favourite literary genre is the short story, and one of its major proponents, Es'kia Mphalele, stressed that writing must create continuous music despite all external violence and chaos (*The Unbroken Song*, 1981).

In *Soleil des indépendances* (1968), Côte d'Ivoire's Ahmadou Kourouma pursued Achebe's experimentations in the French language, and shattered the illusions of those who thought that independence would resolve all of the country's problems. Kourouma denounced the worship of French and introduced Malinké speech into his writings, in a tour de force of Africanization of vocabulary, which he repeated in *Monné, outrages et défis* (1990). Congo-Brazzaville's S. L. Tansi, however, captured the popular French manner of speaking of the capital city Brazzaville (*Les Sept Solitudes de Lorsa Lopez*, 1985).

## ASIA

### India

Rabindranath Tagore (1913*), the Bengali-language novelist, playwright, poet, musician and painter, is one of the most revered and universally known figures of Indian literature. The verses of his *Gītānjali* (1912), translated into English and French, earned him the Nobel Prize. While his immense body of work was created at the beginning of the twentieth century, his humanism, optimism and message of love have continued to exert an influence throughout the century.

Sir Muhammad Iqbâl, heir to the two great writers in the Urdu language, A. K. Ghalib and A. H. Hali, and regarded as the foremost poet of Muslim India, composed Urdu and Persian verse inspired by fervent Sufi mysticism. He believed that, through writing, writers could achieve a personal rebirth that they could then share with the rest of the community (*Gabriel's Wing*). Iqbâl is also known for his philosophical works and for conceiving of the idea that led to the creation of Pakistan in 1947. M. K. Mahatma Gandhi, another emblematic figure, wrote numerous texts in his native Gujarati in addition to his memoirs and an

autobiography translated into English (*The Story of My Experiments with Truth*, 1929), which went largely unnoticed. His ideas later reached a wider readership thanks to Tamil writer K. S. Venkataramani, in his novels (*Murugan the Tiller*, 1927; *Kandan, the Patriot*, 1932) that examine the traditions of Indian villages, initially published in English and later translated into Tamil. Jawaharlal Nehru is best known for his autobiography written in English while in prison and hailed as a masterpiece (*An Autobiography*, 1936). Dhan Gopal Mukerji, a friend of Nehru and a political activist fighting for independence, also published an autobiography (*Caste and Outcast*, 1923). Punjabi writer Mulk Raj Anand wrote a number of novels and Marxist-inspired political works about the Punjab; his *Untouchable* (1935), relating a day in the life of a sweeper, was highly acclaimed. The novels of the left-wing writer Khwaja Ahmad Abbas described a changing society and belong to the same realist-progressive current. Like many others, Abbas recorded his personal perspective in an autobiography (*I Write as I Feel*, 1948). The very popular novelist Krisan Candar also worked in the realist vein with a socialist flavour and an occasional hint of poetic melancholy reminiscent of the work of Rajindar Singh Bedi, which captures Punjabi village life. The Brahmin Raja Rao considered literature a 'religious act' and painted a detailed portrait of an Indian village as it metamorphosed thanks to the inspiration given by Gandhi (*Kanthapura*, 1938); he often travelled abroad and described the problems encountered in other countries by Indian intellectuals (*The Chessmaster and His Moves*, 1988). British author E. M. Forster's *A Passage to India* (1924) continued to be regarded as a classic even after independence. Nirad C. Chaudhuri, born in 1897, in his *Autobiography of an Unknown Indian* (1951), recounted his daily experience of Bengal and retraced the history of India. In England from 1970 onwards, Chaudhuri harshly criticized both countries in the second part of his autobiography, *Thy Hand, Great Anarch* (1990).

In his eight-volume masterwork *Mānasarovar* (*The Holy Lake*), Prem Chand (pseudonym of Dhanpat Rai Srivastava) wrote in a masterly styled Hindi influenced by the nineteenth-century novel tradition. In his novels, especially in *The Gift of a Cow* (1936) and in some three hundred novellas, he focused on the common people rather than the elite. Although the Hindi poetic tradition is deeply rooted in literary and social revolt, it gave rise to a romantic and mystical school, known as Chayavad, characterized by free verse, musicality, and a more meaningful mode of expression. Of the four principal Chayavadi poets, Mahadevi Varma stands out (*Nihar, Rasmi* and *Dipsikha*). *A Time to Change* (1952) collects works by one of the finest English-language poets and playwrights in India, Nissim Ezekiel.

Writing in Urdu, Faïz Ahmed Faïz enriched his poetry with Western prosody, widening the register of traditional images and techniques (*Daste Saba*, 1952). His poems have been frequently reprinted and translated into several languages. One of the finest recent works in Tamil is U. V. Swaminatha Iyer's autobiography (1950). *Vati va cal* by Cellapa explores new possibilities of writing while depicting Tamil village life, whereas the short stories of Jeyakantan described the dire poverty of huge cities. Among the poets writing in Malayalam, three authors stood out in the years prior to 1970, considered the 'golden age' of Malayalam poetry: Vallathol Narayana Menon, Kumaran Asan and Ullor S. Parameshwar Iyer.

After the romantic phase of the Chayavad school, Hindi literature turned to a more socialist and progressive vein, influenced by Marx and Gandhi. Another, so-called experimental trend deals with individuals willing to evaluate themselves critically to make existential commitments or to explore their ego in the light of psychoanalysis. As part of this trend, the novels of Jainendr Kumar, *Tyag Patr, Sunita* and *Parakh*, are regarded as masterpieces.

Most novels published after 1950 addressed the same subjects: social hardship, or the confrontation between Western and Indian values. R. K. Narayan already enjoyed a considerable reputation as a writer with his portraits of the middle classes in an imaginary South Indian town, when he resumed these themes in *Waiting for the Mahatma* (1955). Other authors addressed the more sensitive subject of the partition of the Punjab. Attia Hosain told of her life as a Muslim in India during this period (*Sunlight on a Broken Column*, 1961). Nehru's niece, Nayantara Saghal, also evoked the Punjab during partition in her autobiographical writings, as well as in *Storm in Chandigarh* (1969). The same theme was pursued by Chaman Nahal with his story of the flight of a Hindu family (*Azadi*, 1975). Sikh writer Khushwant Singh is famous for his tragic *Train to Pakistan* (1956), as well as for many other works revealing his irreverent, sardonic wit. Anita Desai enjoys an international reputation; her works mostly explore the solitude and maladjustment of young women in conflict-ridden situations (*Bye-Bye Blackbird*, 1968; *Baumgartner's Bombay*, 1988).

An ardent feminist, Mahadevi Varma is famous for her role in transforming poetry but also for denouncing the injustices suffered by the dispossessed, children and women. In her memoirs (*Sketches from My Past: Encounters with India's Oppressed*, 1989), she drew portraits of the oppressed whose sufferings she had witnessed first-hand. Lurking beneath the surface, however, is a feeling of despair over the injustices she witnessed. Mahasveta Devi, one of the best-known women novelists writing in Bengali and winner of the famous Sahitya Akademi prize in 1979 (*Jhansir Rani*, 1956; *The Son*, 1986), described the plight of tribal communities.

Farrakhan Hendy's innovative post-modernism (*Poona Company*, 1980; *Bombay Duck*, 1990) pursued the tradition of Anglo-Indian humour. Salman Rushdie (Plate 136), a Muslim settled in London, satirized Pakistan in *Shame* (1983), and attracted the wrath and death threats of Shi'ite clerics and other Islamic fundamentalists, along with world fame, on account of his novel *The Satanic Verses* (1989), which mingled real and fantastic social and political elements with 'magic realism'. After Romesh Gunesekera recounted recent Sri Lankan history in *Reef* (1994), he went into exile. Shashi Thapoor confronted Hindus and Muslims in a humoristic post-modern parody of the Mahâbhârata (*The Great Indian Novel*, 1989). The novels of multilingual anthropologist Amitav Ghosh introduce the reader to a world filled with misshapen, grotesque creatures, where prosaic daily life mixes with magic, and the past with the future (*The Shadow Lines*, 1988; *The Calcutta Chromosome*, 1996) (Plate 144).

## Indonesia

The literary movement initiated in 1928 through the emergence of a common written language was suppressed by the Japanese invasion. Pramoedya Ananta Toer was the

only significant author to emerge from what Indonesians refer to as the 'Generation of '45'. Toer fought on behalf of independence and examined the themes of war and guerrilla activity (*Partisan Family*, 1950). One of his later works relates the moral lapse of a petty civil servant and his craving for wealth and luxury (*Korupsi, Corruption*, 1961). Mingling reality and dreams, Putu Wijaya sketches the portrait of a young Balinese who receives a telegram that completely disrupts his daily life (*Telegram*, 1973).

## Viet Nam

Towards 1925, Hoang Ngoc Phach published the first 'modern' novel describing the attempts of an individual to tear loose from traditional family bonds. By 1935, ideas of independence and unity took root, allowing complete artistic freedom to writers who generally drew their inspiration from the various currents in contemporary French literature. Individual liberation and a society in turmoil provided subjects for fiction by Hô Biêu Chánh (in the South) and Nhât Linh (in the North). Poetry, novels, and short stories have flourished over the last few years. In *Le Chagrin de la guerre* (1992), Ninh Bao expressed the deep pain of the protagonist returning from war.

## Japan

The Taisho era, which more or less coincided with the First World War, was marked by executions of 'dangerous' intellectuals. Writers like Ogai Mori abandoned naturalism, went into retreat, and reflected on the values of their country's lost traditions (*Shibue Chusai*, 1916). Soseki Natsume's autobiography (*Michikusa, Grass on the Wayside*, 1915) dwelt on conflicts fed by passion and on the demands of traditional Japanese ethics. But wealthy young writers were open to European influences, such as Ibsen, or Strindberg and various Russian novelists. Pessimism and social concerns distinguished Takeo Arishima (*Aru Onna, A Certain Woman*, 1919) from this group. With his medieval tales, Ryunosuke Akutagawa seemed to be standing on the sidelines, but his stories raised important questions pertaining to the artist and, more generally, human beings in the modern age (*Rashomon*, 1915; *Jigokuhen, The Hell Screen*, 1918). Before committing suicide, he analyzed the madness threatening him, and his reasons for putting an end to his life, in *Haguruma* (*Gear Wheels*, 1927). In the 1920s, young artists were tempted by the various European political and literary 'isms': internationalism, expressionism, dadaism, communism, surrealism, and so on. Proletariat-oriented works included Kobayashi Takiji's distinguished *Kani Kosen* (*The Crab-Canning Boat*, 1929), which denounced the wretched conditions of fishermen. Subjected to torture by the authorities, the author died in 1933. Shimazaki Toson traced the effects of modern reforms on the provincial gentry (*Yoakemae, Before the Dawn*, 1929–35). In 1937, Naoya Shiga finished a long autobiographically inspired novel addressing the problems of a young artist coming to grips with himself and his relationship to his family (*An Ya Koro, A Dark Night's Passing*).

Junichiro Tanizaki published his two great novels, *Tade Kuu Mushi* (*Some Prefer Nettles*), and *Shunkinsho* (*A Portrait of Shunkin*) in 1929 and 1933, but had to wait until after the Second World War to see the ban lifted on the publication of his apolitical masterpiece, *Sasameyuki* (*The Makioka Sisters*), in 1947–48. Tanizaki's last novels, *Kagi* (*The Key*, 1956), and *Futen Rojin Nikki* (*Diary of a Mad Old Man*, 1961–62), analyzed in superb style the ambiguities and manifestations of desire in odd situations. Another major novel to appear in 1948 was *Yukiguni* (*Snow Country*), in which Yasunari Kawabata (Plate 145), in very pure and poetic language, explored his characters' feelings with subtlety and depth. Evoking solitude and the cold of winter at the onset of death, Kawabata describes a city-dweller's love for an imaginary woman in the Land of Snow, but the spell dissolves at the end of the novel with a fire typifying despair. The aesthetics of this work, one of the pinnacles of contemporary Japanese literature, stylizes realism and takes a story to the very limits of language's expressive power, shedding masks to disclose the profoundest truths. Kawabata's *Senbazuru* (*Thousand Cranes*, 1949–51) is a 'miniature novel' steeped in the atmosphere of the traditional tea ceremony, and written with intense psychological realism. His *Yama no Oto* (*The Sound of the Mountain*, 1949–51) explores a dull everyday life and its gradual slide into catastrophe, while his strange *Nemureru Bijo* (*The House of Sleeping Beauties*, 1960–61) mirrors the feelings of an old man gazing at the bodies of sleeping prostitutes. Yoshiyuki Junnosuke's *Anshitsu* (*The Dark Room*, 1969), follows a marginal character's search for his own humanity as he ponders homosexuality, life and death. Yukio Mishima carefully explored various perversions, as in *Kinkakuji* (*The Temple of the Golden Pavilion*, 1956), in which he describes the descent into madness of a young monk who finally sets a famous temple on fire, or *Utage no Ato* (*After the Banquet*, 1960), which relates the life and marital problems of a businesswoman. Kobo Abe revealed the identity problems of his characters by putting them in unsettling situations; a city-dweller falls into the hands of a savage tribe in *Suna no Onna* (*The Woman in the Dunes*, 1962). Elsewhere, Kobo resorted to science fiction, the adventure genre, or the detective novel, to cast further psychological light. Kenzaburo Oe (1994*) depicted in tones of grotesque humour an anguished individual's struggles against a hostile environment (*Manen Gannen no Futtoboru, The Silent Cry*, 1967). Jun Ishikawa established his reputation with short stories in the 1950s, but truly came into his own with a post-modern novel of extraordinary fantasy, *Kyofuki* (*Tales of Crazy Winds*, 1980), which blends slang with erudite allusions and explores many facets of contemporary society.

Among younger writers, Kenji Nakagami stands out for the quality of his fiction with *Sen-nen no Yuraku* (*A Thousand Years of Pleasure*, 1982), and *Nichirin no Tsubasa* (*On the Wings of the Sun*, 1984). Yuko Tsushima (*Yoru no Hikari ni Owarete, Pursued by the Light of the Night*, 1987) and Eimi Yamada (*Bedtime Eyes*, 1985), are gaining a considerable reputation for their highly imaginative touch.

## Korea

After Korea was annexed by Japan in 1910, Yi Kwang-su pursued his country's new novel tradition with a didactic work on the theme of good vs. evil, *Mujong* (*Heartlessness*, 1917). As the independence movement gained momentum,

novels acquired a more naturalistic character. Yom Sang-sôp drew a sad and brutal picture of Korean society in *P'yobonshilui ch'nonggaeguri* (*Green Frog in the Specimen Gallery*, 1921). Throughout the 1920s, intellectuals took a stand in favour of their country's workers and peasants; in 1930, Yi Ki-yong published a violent novel, *Sô-hoa*. More 'aesthetic' authors turned their attention to nature again in the 1930s, and, until 1945, harsh measures by Japanese occupation forces effectively muzzled writers. In 1953, after the Korean War, some denounced the country's partition, while others decried the northern expansionism. Subsequently, writers tended to revolt against Syngman Rhee's authoritarian regime. Poet Pak Tu-jin (*Sa-wôl man-bal, April Flowers*, 1966) celebrated the renewal of a literature of revolt. As of 1980, younger writers in their short stories described urban economic and social upheaval, jumbling past traditions with modern conditions. In *Mandala* (1990), Kim Sung-dong wittily recounts the adventures of two Buddhist monks in the modern world.

## China

Although political, social and economic upheavals of all sorts overwhelmed twentieth-century China, considerable literary production continued unabated. Hu Shi's manifesto (1917) pleaded for honest expression of feeling in language closer to modern speech, while the literary world welcomed foreign influences, especially Russian and French. Realism and introspection dominated the novel and especially the short story, the most favoured genre. Poets and writers founded literary reviews, such as the celebrated magazine *Chuangzao* (*Creation*) (1920s) whose two most famous contributors were poet Guo Moruo and playwright Tian Han. Guo Moruo dominated the literary field until his death in 1978, publishing romantic and pantheistic poems like *The Goddesses*, 1921, through which he expressed his wish to see the world lit by a 'new sun', love poems (*The Vase*, 1925), novels, short stories, and autobiographical fiction (*Dead Leaves*, 1936). Tian Han found it harder to attain widespread popularity with his European-inspired plays in the face of a vibrant traditional theatre. Nevertheless, Tian Han's increasingly complex dramas, such as (*Nangui, Return to the South*, 1929) made him a highly esteemed playwright.

Lu Xun is considered by many to be the father of modern Chinese literature (Plate 146). His first major work, *A Madman's Diary* (*Kuangren riji*, 1918) – inspired by Gogol's tale – denounces a society trapped 'in an iron cage', doomed to suffocation, where if there is a glimmer of hope it comes from the tale's children, who are not 'cannibals'. His undisputed masterpiece, the short story entitled 'The True Story of Ah Q' ('Ah Q Zheng-Zhuan'), appears in his collection of novellas (*Na-han, Call to Arms*, 1923). A young man rebelling against the customs of his village is tormented by his fellow villagers and eventually cast out and executed. The village decides that their scapegoat must have been guilty simply because he was punished. Lu Xun condemned the cowardice of both victims and executioners. He explored the deeper recesses of his ego in prose poems with a Nietzschean ring (*Ye Cao, Wild Grass*, 1927), and both criticized and deplored, in brief essays very much appreciated at the time, the injustices of civil war and the turmoil of the intellectuals. Yu Dafu somewhat autobiographically

described the plight of a student exiled in Japan and driven to suicide through exclusion and despair (*Sinking*, 1921). Ye Shengtao's short novel *Gemo* (*Barriers*, 1922) tersely narrated an ordinary young woman's forced marriage, her drudgery on a farm, her repudiation and subsequent widowhood, and her being sold into bondage by her own in-laws. Another of Ye Shengtao's novels, *Ni Huanzhi* (1928), traced a schoolteacher's disillusionment with the behaviour of local notables and the violence of Nationalist repression in Shanghai. Mao Dun's trilogy (1927–28) also depicted disillusioned characters anxious for their future after the failure in Shanghai. Mao Dun's *Hong* (*Rainbow*, 1929), inspired by the intellectual vogue of Ibsen at the time, dwelt upon the difficult emancipation of a young middle-class woman who finally joins a group of Communists. His well-known novel *Ziye* (*Midnight*, 1933) describes industrial blight, workers' strikes, and social conditions in Shanghai during the crisis in 1930. But after *Fushi* (*Putrefaction*, 1941), the journal of a young woman forced to spy for the Nationalists, Mao Dun disappeared from the literary scene until the end of 'deculturation' in 1978. Ba Jin's characters, faced with oppression and injustice, either transcend their limitations through self-sacrifice for their comrades, or struggle for freedom against their family clans. In *Anye* (*Frozen Night*, 1947), a young woman flees in the midst of the Japanese invasion, leaving her husband behind to die slowly of tuberculosis.

Lao She wrote satirical, humorous novels like *Luotuo Xiangzi* (*Rickshaw Boy*, 1936), then told the fable of a peasant in Beijing thrice favoured by fortune and each time left poorer than before. Lao She's *Sishi Tong Tang* (*The Yellow Storm*, 1943) portrayed life in China's capital under Japanese occupation. In 1946, Lao She left China for the United States but returned to her homeland in 1949. Another figure to leave for America was playwright Cao Yu, well known for theatre ranging from his *Leiyu* (*The Thunder Storm*, 1933), reminiscent of Racine's *Phèdre*, to his dramatization of humanity's struggle against the forces of fate (*Qiao, The Bridge*, 1939). When Cao Yu returned to China, he began an autobiography, but in 1966 was humiliated like so many other writers. Wu Zuguang's refined and poetic language marked his plays as among the best in modern Chinese drama (*Fengxue Yegui Ren, Return by Night in a Snowstorm* 1942). Guo Moruo wrote various historical tragedies (*Hufu, The Tiger's Seal*, 1942; *Kongque Dan, Peacock's Gall*, 1942) and went on to produce popular drama in keeping with the dictates of the Maoist regime. In 1961, Wu Han, a professor of history, wrote a play called *Hai Rui Longuan* (*The Dismissal of Hai Rui*), depicting a Mandarin concerned with justice and integrity; but because of its implications against the regime, the piece came under ferocious attack as a 'poisonous weed' by a young Shanghai critic in 1965. Authors like Tian Han and Mao Dun were gradually permitted to write again, but despite official pledges of liberalization, freedom of expression often remained curtailed, and the 'Beijing Spring' of 1978–79 was short-lived. However, literary criticism was somewhat open to foreign influences, and prose writers and poets continued to be heard. Zhang Xinxin published an autobiography in 1981, and hundreds of interviews taped across the country were collected in his *Beijingren* (*Sinanthropus*, 1986). Novelist Wang Anyi was applauded for her *Huangshan Zhi Lian* (*Love on a Desert Mountain*, 1986), while Yu Hua showed how a sense of

honour and dignity could help individuals to stubbornly survive poverty and the miseries inflicted by political upheaval (*Xu Sanguan Mai Xue Ji, Chronicle of a Blood Merchant*, 1996).

## OCEANIA

### Australia

Ethel (Henry Handel) Richardson's trilogy, a novel which relates the tribulations of a nineteenth-century immigrant (*The Fortunes of Richardson Mahony*, 1930) is considered to be the masterpiece of early twentieth-century Australian literature. Judith Wright's poetry, expressed in a modern voice using traditional forms, stressed her faith in life (*The Moving Image*, 1946,) while A. D. Hope's pessimistic verse depicts listless individuals trapped in a meaningless world. Preoccupation with the past and the countryside, along with metaphysical concerns, tended to overshadow urban realism in such novels. Xavier Herbert opposed whites and aboriginals to evoke cosmic energies in *Capricornia* (1938). Patrick White (1973*) retold the story of the explorer Leichart, transforming him into an extraordinary character driven by a godlike urge to create and possess an entire continent (*Voss*, 1957).

After the Second World War, writers focused on social problems: opposition between rich and poor, conflicts between long-time settlers and recent immigrants, and the gender gap. Peter Carey's *The Fat Man in History* (1974) mingled realism and fantasy, with some of the characters defeated and exploited by others. In Carey's *Bliss* (1981), H. Joy appears to 'die' of a heart attack, but returns from the beyond with his perceptions completely modified: he eschews his former hypocritical way of life and takes to the jungle with a young woman in search of happiness. Gerard Lee's *True Love and How to Get It* (1982) described Brisbane's assorted communities of hippies, punks and lesbians, while Helen Garner's *Monkey Grip* (1977) depicted a bleak Melbourne suburb where drugs and poverty held sway. In *The Children's Bach* (1984), Garner took a look at the world of adolescents.

Aboriginal playwright Jack Davis retraced 150 years of confrontation between his people and the whites in *Kullark* (1972). This play included dance, music, pantomime, and patches of dialogue in a mixture of English and aboriginal languages. Davis's verse (*Poems from Aboriginal Australia*, 1978) examines present injustice while dwelling nostalgically on the past. Both Jeff Davis and the country's most noteworthy aboriginal novelist, Colin Johnson, criticized whites and aboriginal communities in equal measure. Johnson's historical novel, *Doctor Wooreddy's Prescription for Enduring the Ending of the World* (1983), involves a Tasmanian aboriginal who, in a trance, interprets the coming of the ghostly whites as a sign of the Apocalypse. With its protagonist who steals, kills, and dodges police, violence again predominated in Johnson's *Wild Cat Falling* (1975), as it did indeed in the novels of many writers after him. Archie Weller's partly autobiographical *The Day of the Dog* (1981) described unemployment, apathy and despair among the police-hounded aboriginals in Perth; the main character and his companions eventually kill themselves to escape falling into the hands of the police.

### New Zealand

Only in the mid-1930s did a truly New Zealander novel see the light of day with the publication of Alan Mulgan's *Spur of the Morning* (1934) and its 'late colonial' mentality. Only five years later, however, his son John won distinction with *Man Alone*, which marked the beginnings of a new so-called 'provincial' sensitivity. Such a break found metaphorical expression in a theme taken up by a majority of writers: an alienated child or adolescent pushed into violence, murder, or madness, under pressure from his or her puritanical parents' brutal or insidious family structure, as in Ian Cross's novel *The God Boy* (1957). David Ballantyne's *The Cunninghams* (1947) portrayed a family in the 1930s, secular but puritanical, hypocritical, uneducated, and devoid of any political awareness or future prospects. Such confrontation reached its apex in Bill Pearson's *Coal Flat* (1963). Playwright, poet and essayist Frank Sargeson dealt with a similar subject in *I Saw in My Dream* (1949), but then moved on to other themes. While social problems remained very much the backdrop for all of Sargeson's writing, the exploration of one's inner life eventually took precedence, along with experimentations in form: his *Memoirs of a Peon* (1965) and *Joy of the Worm* (1969) broke up time and space by resorting to inner monologue, myths and symbols. Maurice Gee's *Plumb* (1978) trilogy brought to life three narrators, each with a distinct perspective, as they progressed through an uncertain and absurd world.

In recent decades, novels and verse by Maori writers have been published in increasing numbers. A number of fiction writers stressed their own identity aggressively, as in Robert de Roo's *Through the Eye of the Thorn* (1984) or Michael Henderson's *The Log of the Superfluous Son* (1975). Keri Hulme's *The Bone People* (1983) was finally taken seriously, after grudging acceptance in some quarters as a mere anthropological or sociological document. Unfortunately, this has been the fate of Maori poetry generally, despite its great wealth.

\* Indicates year in which a writer received the Nobel Prize for Literature.

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# 26.2

# NATIONALISM AND INTERNATIONALISM
# IN MODERN ART

## *Caroline A. Jones* and *John Clark*

### NATIONS AND OTHERS

#### Some *Demoiselles*

Sometime around 1907, the Spanish avant-garde artist Pablo Ruiz Picasso fixed a canvas on a wooden stretcher and covered it with oil-based pigments in the traditional manner of classic European paintings. But the particular arrangement of these pigments resembled nothing familiar, and many Europeans were shocked by the work. At first, the title was little more than an informal phrase uttered among the artist's friends and acquaintances. When Picasso finally finished his large canvas, he merely propped it against the wall of his Paris studio where it remained for decades virtually unexhibited. Yet no one who saw it could forget it. Today, despite its somewhat secretive beginnings, the 2.5-metre-high painting hangs in New York's Museum of Modern Art (MOMA), where millions of viewers can read the label identifying one of the most famous of all modern paintings: 'Pablo Picasso y Ruiz; (b. Malaga, 1881, d. Paris, 1973): *Les Demoiselles d'Avignon*' (Plate 147).

There is no better place to begin an investigation of the tensions between nationalism and internationalism in modern art than to imagine ourselves standing before this painting, by this particular artist, in this museum. New York's MOMA (founded in 1929) was one of the first institutions to conceptualize and give concrete meaning to 'modernism' by collecting objects representing a wide range of human activities in the twentieth century: not only painting and sculpture, prints and drawings, but also films, photographs, racing cars, chairs, propellers, and coffee mills. In the implicit and explicit pedagogy of the museum's collections, Picasso's unprecedented *Demoiselles* marked a defining moment in modernism – everything before belonged to an earlier tradition, and everything after it had to contend with a new universe of forms and meanings. This painting also reveals the discourses of nationalism and internationalism of modernism – at least insofar as modernism has historically been defined by the nation-making cultures of the European West. An analysis of *Demoiselles* will illustrate the theme of this chapter: namely, that attempts to be 'modern' in the twentieth-century visual arts have been shaped and constrained by the pervasive discourse of nationalism, yet modernism has also worked to confound, displace, and destroy the common perception of the concept of 'nation'.

From the very beginning, *Les Demoiselles d'Avignon* was perceived as a painting about the disruptions of modern times. The Spanish painter had transplanted himself in Paris, the cultural capital of the Western world. There he produced images related to modernism's recent European past as well as to the distant classical traditions from which it derived its legitimacy. Through *Demoiselles*, Picasso was also investigating the desires of modern European nations to reach outside their own borders in order to become world powers by colonizing 'others'. Fellow painters and critics considered this canvas a declaration of stylistic allegiances that were irrevocably split between the work of late-nineteenth-century French painters such as Paul Cézanne, on the one hand, and works of anonymous African sculptors, on the other. At the time, African objects were gaining popularity among collectors in Paris. Cézanne's canvases had been newly canonized as masterpieces of French modern art. The ethnographic objects that found their echo in Picasso's painting were not considered art at all, but rather representations of a 'primitive,' pre-modern past that the Spanish painter had stumbled upon in the basement of Le Trocadero (France's colonial Musée d'Ethnographie du Trocadéro, now known the Musée de l'Homme). Although Picasso's twin pole stars – Cézanne and Africa – occupied different conceptual universes, each would prove indispensable for the course of modernism in the visual arts.

Taking Picasso's *Demoiselles* as an acknowledged monument of Western painting in the twentieth century, this chapter will first investigate the many claims for modernism involving ideologies of 'nation' through selected objects of visual art. We will examine modernism's ambition to represent a neutral, value-free ideal of progress (encompassing economic, scientific, technological and industrial development), while acknowledging that such claims may be irretrievably Eurocentric. We will also, however, critique simplistic views of modernism as the exclusive agent of a hegemonic Western capitalism, identifying alternative and hybrid forms of modernism found outside the Western or capitalist countries or

within the very interstices of the Western art world. Specific art movements and works will be viewed as 'speaking of nation', and others will be analysed in terms of the ways they have worked to counteract nationalism within the countries and cultures from which they emerged. Finally, we will address the late twentieth-century phenomenon of 'post-modernism,' and ask whether the art forms produced under that label have successfully escaped the nationalism vs. internationalism debate by striving to be 'global'.

From the outset, it must be acknowledged that the two terms in the chapter's title – 'nation' and 'modern' – have been dissected by a variety of post-colonial thinkers. Inherent in the concept 'international' is the assumption that 'nation' is the unitary measure, the basic organizing principle without which the people of the world cannot be conceptualized or understood. Yet although these terms can be deconstructed to reveal the extent to which they are intertwined (both host to a cluster of socially determined, culturally laden meanings), they remain indispensable. The twin axes they present (embedded though they are in the very contexts we seek to understand) remained crucial nodes of discourse throughout the twentieth century, particularly in the visual arts. 'Nation' is merely the modern term for centralized state power. Visual culture, at least since ancient Egyptian times, has provided the most direct way of expressing that kind of power – the astonishingly changeless Egyptian canon powerfully demonstrated the capacity of the Pharaoh to control the means of his own representation (and the constrained possibility of 'the people' to have access to and negotiate with such representations). In the modern period, of course, power can be distributed in less obvious ways, and artists have been less and less dependent upon a centralized source for support and patronage. Yet perhaps because of this independence (or abandonment, depending on one's point of view), which has produced the 'alienated avant-garde artist' as a standard modernist conceit, the twentieth-century artwork illustrates all the more powerfully the ambivalent give and take between the concepts of nation, subject, and modernity.

The five demoiselles of Picasso's painting illustrate this ambivalent dynamic. These members of the world's 'oldest profession' are anything but classically distant. They occupy a 'philosophical brothel', as the painting was described, and yet they confront us with their bodies rather than their minds. The women's hard-edged nudity and provocative poses surely contributed to the painting's final title, which translates as 'the young ladies of Avignon' (a well-known red-light district in Barcelona). Picasso sets this whorehouse in his native Spain, but paints it in Paris, where prostitution proliferated. For Picasso, prostitution had personal as well as intellectual significance.

Art historians have reconstructed in detail the genesis of this work considered so important in Picasso's career. Picasso himself later described the canvas as an 'exorcism', and we know from sketches that he initially put himself in the painting, either as a sailor entertained by the prostitutes or a medical student entering from the left (studies show that both sailor and medical student were veiled self-portraits). The primary confrontation, then, was intended to be between sex and death, disease and knowledge, but Picasso's choice of a sailor to represent one aspect of his identity is significant. On one level, the choice was fuelled by ambition: Picasso's principal competitor, the French Fauve painter Henri Matisse, had also painted several versions of *The Young Sailor* just after returning from the French colonies in North Africa in the summer of 1906. On another level, the sailor stood for the transnational status of Picasso himself. His studies for this figure show him rolling a cigarette (a quintessential New World vice) and wearing the traditional sailor's bib and a dark cap with a white pom-pom. Beyond designating a lowly deckhand, the sailor's costume cannot be easily identified as French or Spanish (or English, Russian or American). Its very undistinguishability and commonness cements the deckhand in a larger maritime system of power, to which he is subordinated, but which he also represents. Sailors are mobile and serve as agents of their flags. They escape the centralized economy of the nation-state, but also play the role of unofficial ambassadors. In addition, they embody both the confrontation with native 'others' and the sexual experience that can result from confrontation. The iconography of the sailor is thus linked to the diffuse and expansive boundaries of the European nation, which was involved at that very period in a global contest to control sub-Saharan Africa.

The sailor (for both Picasso and Matisse) is a transitional figure. Buried in the *Demoiselles*, Picasso's sailor represents the international reach and ambition of the nation, incarnated in an erotically charged, restless, youthful male form. The fact that this male was ultimately transformed into a female in Picasso's numerous preliminary studies confirms the ambiguous status of the demoiselles. Crossing gender borders, the figures eventually lost any clearly male attributes, and their potential maleness remained only in their confrontational stares and the painting's implied male voyeurs. As we gaze at the women in this painting, we take the place of those imaginary modern men.

Since the pictorial space of Western painting is generally read from left to right, there is an implied sequence in the five demoiselles and their surroundings (indeed, Picasso painted and revised them in this left-to-right order). In this progression, the figure on the far left is depicted with an expressionless, mask-like face similar to Oceanic-inspired works by the French painter Paul Gauguin, and her pose was described at the time as Egyptian. Like the two central figures, her face also evokes ancient Iberian sculpture (pre-Christian statuary from present-day Spain) similar to the two Picasso had recently purchased with the help of his dealer. The echo of Iberian sculpture is noteworthy, for this native Spanish style was merely a local variant of the classical sculptural traditions that characterized the prevailing 'international' mode. In the context of French painting, which was still dominated by academic Salons considered the 'true heirs' of ancient Greece, such references to the 'primitive' and the local (Oceania, Egypt, Iberia) were intended, and indeed experienced, as a jolting shock. The ambitious young Picasso was eager to take his place in the Parisian art world, and what interests us here is that he did so by means of one of the oldest forms of Spanish and classical Western art. The artist thus begins with an acknowledgment of his own status in France as a 'Spanish primitive', but makes the simultaneous claim that 'primitive' is a part of a tradition leading to a transnational modern world.

Picasso's first Iberian demoiselle holds up a piece of dark reddish-orange drapery, mirroring her counterpart on the

right, who is enclosed by a pair of blue drapes. This interest with cloth thus brackets the image, and extends throughout the whole painting (the entire painting being a kind of heraldic cloth). The room is claustrophobic and swathed in fabric, atypical for France. It is somewhat overdone when compared with academic painters' much-fantasized Moorish harems and orientalizing baths. Each of the demoiselles wraps herself in textiles of red, white, or blue. These very colours are suggestive of a discourse on nations, and the hues (patriotic within French, English, or American contexts) are arranged in broad vertical bands, as in the French flag. Picasso's painting, however, inverts the colours of the French *tricolour*. As if hung upside-down, or seen from behind, the colours are reversed – leading to the speculation that, if he was conscious of this flag imagery at all, Picasso chose a bottoms-up, backside view against which to display his Spanish primitives.

Concerning the two figures on the right, their faces are not based on Egyptian and Iberian models with their dark, jarring striations and aggressively twisted noses. As mentioned above, the compelling features of these demoiselles derive from African sculpture (primarily masks from the French Congo that Picasso's friends owned or ones that he viewed in the Trocadero Museum). Sub-Saharan Africa is thus the second theme on which Picasso projected his vision of modernism – syncretically amalgamated with European art. These are not depictions of African masks or sculptures such as those that would appear in contemporary works by other French painters such as Matisse or Derain. Nor are they the careful representations of African art forms painted by members of the New Negro Movement in New York a few decades later (by African-American artist Lois Mailou Jones, among others). Picasso's masked demoiselles are neo-Africans, fused figures from Picasso's imagination. Boldly thrusting through a slit in the blue section of the draperies, the uppermost of these neo-Africans stares not at us, but at the other women in the painting. Her frontal eye is black and blank (an unworn mask), and only the profile eye peers sideways at the others. Like the other demoiselles, who take the places of Picasso's vanished sailor and medical student, this angular creature also had a Picasso look-alike in her shadowy past, a male precursor with whom she is now blended. In a sketchbook of preparatory studies for the *Demoiselles*, Picasso drew this male figure over and over again, sometimes endowing it with his own features. Thus, like the Iberian-Egyptian figure, this mirroring African on the right is a substitute for Picasso, both metaphorically and psychologically. If she stands as an African 'other,' she also functions as the projection of Picasso's own desire, a magical exorcist which will enable him to achieve his ambition to be the great painter of the modern age.

The squatting demoiselle, by contrast, was always a female, although her 'wrung' neck appeared only in the last violent stages of the painting's execution. The body below her shockingly twisted head is reminiscent of the great tradition of odalisques, particularly the orientalizing harem scenes painted by the great French neo-classicist Ingres (scholars have unearthed Picasso's many studies of Ingres' odalisque paintings, which had been set in imaginary settings appointed with Turkish or Moroccan furnishings). As in works by Ingres, the bodies of the odalisques in Picasso's masterpiece are depicted with white skin. But in all other respects, Picasso mixes European tradition. His

odalisque does not coyly avert her head, as is the custom in the genre. Instead, the painter violently rotates the head, which is darker than her body (as with the Egyptian-Iberian and other neo-African in the painting), until it meets our gaze. In addition, the head is covered by a mask, which serves to intensify the confrontational stare.

It is hard to make the case that Picasso identified with this scarified sibyl, whose face is as disconnected from her body as a helmet-mask propped upon her strong, muscular shoulders. The suggestive visual reference to helmet masks recalls the female masks worn by the male members of the Gelede masked society of the Yoruba people in West Africa. A typical example of one of the Gelede masks from the Parisian museum that provided Picasso with the inspiration for his 'exorcism' painting shows the facial striations, forehead scarification, pinpoint-pupils in almond-shaped eyes, projecting ears, and thick neck ring that are also present in the second of Picasso's neo-African demoiselles. The head's function as a mask invokes a complex system of criss-crossing associations (between wearer and depicted identity, or between painter and depicted mask) that reflects the transgender aspect of other demoiselles. The transgender traditions of the particular masks Picasso appropriated from the Trocadero Museum have gone largely unnoticed by scholars who have studied primitivism in the work of Picasso. Yet given the strong evidence in the *Demoiselles'* studies for Picasso's own transgender investigations, such traditions seem important for the painting's modernism – reinforcing its purpose to shock, unsettle, and displace Western art by crossing boundaries of nation and sex.

Picasso was undoubtedly incapable of faithfully importing the social intentions of these masks (of which he and his Parisian companions probably understood very little), but neither was he merely 'copying' exoticism within a Parisian milieu. Rather, the artist interjected admittedly foreign forms to construct a hybrid identity, which he introduced in his painting by choice, and in a larger social context by accident, through his stigmatization as a foreigner among the French. Desire-through-identification is extremely complex, for it is the desire of the white male artist to identify with a white female body, itself masked as a black female African (via masks originally intended to be worn by African men). This complex relationship is expressed most powerfully in the last, most transgressive and modern demoiselle, who is squatting at the lower right.

The *Demoiselles'* implications for the discourse of nation are far-reaching. Picasso can place himself into a French modernist tradition only by performing his Spanish stigmatization as Moorish and African, the hypothetical subject of French colonial rule. His demoiselles perform their primitiveness on several levels: as Iberian, as Moorish denizens of a contemporary harem, as naked sex workers in the French national context (wrapped in that inverted flag). Picasso suggested this complex theme of oscillating national and ethnic identities on a page of the sketchbook he used during the completion of *Demoiselles*, on the verso of a study for the final 'neo-African' figure. On this small sheet, Picasso has written in decorative script: 'Barcelona... France... Malaga... Madrid... Ravignan' and, below, the artist signed 'Monsieur ARRRRRRR' probably in homage to the French anarchist playwright Alfred Jarry.[1] In this context, Spain (Barcelona where he grew up, Malaga where he was born, Madrid the home of the Prado Museum) becomes the 'other' for France, where Picasso's studio is located (on the

Rue Ravignan). Spain here is nothing less than the Moorish portal to Africa, the dark gateway to the colonized, humiliated people of the sun. But in the eyes of imperial power, the subjugated 'other' always threatens to become the future. Picasso's *Demoiselles* claims that position.

The green and blue striations on the heads of these neo-Africans demonstrated by their 'coloured' qualities that they were not, for Picasso, pictures of real African masks (coloured examples of which were not then available), but 'coloured' peoples' masks in general. Although they did not belong to any particular African culture (such as Kota, Baga, Fang, Bambara, Gelede, or Dahomean), the demoiselles' disjointed faces combined the styles of many different African cultures to attain a syncretic, pictorial (i.e. Western) identity. But in doing so, Picasso's great achievement was to critique Western figurative tradition from within, by having his figures burst like invaders from behind the curtains, swivelling their heads to confront us with a malefic and challenging stare. The *Demoiselles d'Avignon* exemplified a type of modernism designed to destabilize notions of national culture, while using the very symbols (racial, ethnic, gender, political) of national identity to fuel its critique. The fact that Picasso depicts his neo-African as twisting and tearing the fabric of the *tricolour* suggests that French culture must be conquered. African culture, which represents the 'other' for Picasso in his own country of origin, is presented here ostentatiously, as violently different from France's civilization – yet crucial to it's modern future. Picasso's provocative mixing of nations and identities forces us to view the African contribution to modern art, not just formally (the much-praised sculptural qualities of African forms were appropriated by cubism) but economically, politically, and erotically, as subjugated figures of desire. The *Demoiselles* breaks with the past, but only to perpetuate the old subject of modernism and nationhood: French tales of noble savages and revolutions, told as both national and available to universal man, would now become wilfully hybrid in the disconnected, syncretic crucible of this great 'exorcism' painting.

## The driving metaphor: avant-garde

Developing within the context of French modernism and exemplified by paintings such as *Les Demoiselles d'Avignon*, the cultural enhancement of the best modern art as avant-garde reached a peak in the first half of the twentieth century. The military connotations of this French expression were appropriate, coming from a period marked by a succession of skirmishes and revolutions that culminated in the First World War. Against the bulky reality of early twentieth-century warfare – massed phalanxes of troops and machines moving in large formations – the avant-garde was synonymous with those solitary scouts who moved ahead of the mass, scanning the horizon for danger and opportunities. But also suggested in the metaphor of the artist as 'scout' is the certainty that the military avant-garde worked (like Picasso's sailor) as the representative and agent of the king or state. Moving solitarily through the underbrush at the campaign's 'cutting edge,' the scout's advance knowledge was intended to facilitate victory – the triumph of the sponsoring nation on the world's political (and cultural) stage.

Picasso was one of the first to understand the perils and pleasures of this vanguard structure – victory in modernism

goes to whoever is the first to stake a claim. Notwithstanding Picasso's intense collaboration with French painter Georges Braque, the Spaniard was notoriously leery of allowing too many clever aspiring artists to see what he was working on, lest he jeopardize his leading position at the forefront of modernism. Nonetheless, toward the end of 1913, Picasso allowed the Lithuanian sculptor Jacques Lipchitz to bring an unknown Russian, fresh out of art school, to Picasso's studio (relocated to the Boulevard Raspail). Recorded in photographs taken at the time, the workspace was a modernist *ensemble* – African masks jostled for space with cubist canvases, paper collages and an entirely new genre of cubist-constructed sculpture. Particularly striking were these paper, sheet metal, or wooden assembled sculptures in which representational three-dimensional models of objects were juxtaposed with radically abstracted three- and two-dimensional signs, all installed against the wall and hovering dynamically between the formerly stable categories of 'relief' and 'picture.' *Guitar* of 1912 (Plate 148) was perhaps the most important of such objects to emerge from Picasso's studio (none of the other works has survived). Informed by the radical inversions typical of an African Grebo mask in which the sculptor transforms sunken eyes and mouths into geometric protuberances, Picasso constructed a representation of a musical instrument, whose illusionism relies on the switching of a negative space (the guitar's sound hole) into a positive geometric form (the projecting cylinder at the guitar's centre). Cues from African art were crucial for cubism's genesis, and sculptures and paintings combined these lessons with indigenous French traditions of caricature and philosophies of experiential time (such as Henri Bergson's notions of flux and simultaneity). In developing cubist painting and collage, Picasso and Braque had already mastered this hybrid approach to representation; in *Guitar*, Picasso merely brought such discoveries into sculpture. The hermetic investigations of high analytic cubism, as this style was called, achieved a crucial breakthrough in the formal language of modern art – a breakthrough dependent on a rejection of mimetic 'imitation' (staple of the academic oil painting tradition) in favour of 'signification' – a free manipulation of the signs for the world's objects and ideas. A mouth could be a cylinder, a slit, a line, a hole, or a word; an object could reside in the same pictorial and conceptual plane as a mathematical formula.

Overwhelmed by what he saw careening off the walls in Picasso's studio, Lipchitz's young Russian friend begged Picasso to be hired as his assistant. When Picasso refused, the story goes, the would-be apprentice wandered outside, 'suddenly sat down on the pavement … and mumbled, "There's something behind it … I'll break his neck."' thus plotting the skirmish to foil his better-armed opponent.[2] Eventually abandoning dreams of violence after many more visits, our avant-garde scout Vladimir Tatlin returned to his homeland, where he became the founder and most important practitioner of his country's national modern style, Russian constructivism.

So begins the second emblematic moment of our narrative of modernism, nationalism, and internationalism. An Eastern European Jew takes a student of Russian icon painting to meet a Spanish artist in his Paris studio, where forms from Iberian sculpture, African masks, French art and philosophy stimulated a new conception of space. If, as we have argued, Picasso remained a conflicted player in the complex field of geo-political signs and symbols, Tatlin's

goals became clear after the Russian Revolution: 'an opportunity emerges of uniting purely artistic forms with utilitarian intentions ... which stimulate us to inventions in our work of creating a new world'.[3] Avant-garde proved the most powerful metaphor possible for the role Russian artists sought. In Tatlin's Promethean travels, the fire of modernism had been stolen, and it would be used to forge the new citizen-subject of the collective state.

Tatlin, of course, was not entirely unprepared for what he encountered in Picasso's studio – otherwise, why would he have attempted to go there? An unhappy and disrupted childhood had led him to an early career as a sailor; his work as an icon painter and several aborted courses of formal art study finally brought him to the Peredvizhniki (Wanderers) Group, whose goal was to create 'an art relevant to Russian reality [and] contemporary conditions'.[4] The requisite restlessness and aspirations of modern artists to participate in the production of a new national style were thus already in place when Tatlin was introduced to the ideas of cubism by Mikhail Larionov and Natalia Goncharova, then leaders in Moscow's contemporary art world. Cubist paintings could be seen in the Shchukin Collection and in various loan exhibitions that travelled to Russia before Tatlin left for Paris.

Thus, before his revelation in the presence of Picasso's sculpture, Tatlin knew some of the experimental cubist techniques of collage and *papier collé*, in which disparate materials (paper, cloth, wallpaper, tinfoil, rope) were fixed to a flat support, with the resulting surface contradicting the imported semiotic bits. Tatlin's self-portrait of 1911 – in which he depicts himself as a sailor – reveals none of these techniques. It resembles more the graphic, curvilinear style of Russian icons than it does of cubism's innovations (Plate 149) and bears almost no relation to the radical constructions Tatlin would produce after his fateful visits to Picasso's studio. Those later 'corner reliefs' and 'counter-reliefs' incorporated curved sheets of iron, wires, sections of glass, and planes of wood – all intersecting at angles, with the whole mounted to perch weightlessly in the corner of a room, like a flying machine in equilibrium.

Just as Picasso had created a perceived heritage from antiquity (Iberian sculpture) or primitive art (African masks) with the latest influences of 'high' culture (Cézanne, French philosophy), so Tatlin and his proponents found ways to connect these innovative modern constructions with both the icon-painting of Tatlin's past, and the international future of Russian art. Describing the traditional icon – a devotional image of the Virgin Mary painted on a wooden panel overlaid with precious metals, jewels, hinges and screws – a contemporary critic identified the links connecting such a sacred Russian object with the cubist art of collage: 'The real world is introduced into [the icon's] creation only through the assemblage and incrustation of real, tangible objects. And this seems to produce a combat between two worlds, the inner ... and outer'.[5] Nothing could be more urgent for young artists working in Russia than the need to relate the traditional inner world of Russian orthodox Christianity, the dominant source of a national folk style, to an emerging outer world of modern urbanism and political change, represented by French cubism. Tatlin and his followers drew some of their ideas from (and contributed others to) the Italian futurists, who were also struggling to modernize legacies of religious art by evoking technological innovation. Although occasionally also

labelled 'futurist', the Russians sought their own names for Tatlin's work and for the new movement in Russia as a whole. Some fought for an etymologically Russian word, *postroenie* (built-up), rather than the foreign-based word *konstruktsiya* (constructed). However, no name was adopted universally until after the Revolution, when 'constructivism' emerged as the Western label for the extraordinary experiments in art and nation-building that were taking place in the former Russian empire.

The disasters and disruptions prompted by the First World War, which gave the metaphor of the avant-garde its new international currency, also marked the destruction of the Russian empire along with many others. Replaced initially by a democracy (the February Revolution), leadership shifted violently once again with the October Revolution and became reasonably stable only after the Bolshevik Party took power in November 1917. However, civil war and counter-revolutionary insurgency was rife. In this unstable atmosphere, artists such as Tatlin were burdened with heavy responsibilities: they were asked to use their art to build a new national and political consciousness, buttressed by new governmental culture institutions such as the People's Commissariat for Enlightenment (Narkompros). For a variety of reasons (probably the most important being the enduring leftist leanings of most of the Russian artists who considered themselves part of the avant-garde), the young group of innovative artists (Larionov, Goncharova, Tatlin, and others) seemed to have predicted the future, which they were now invited to oversee. Avant-garde became more than a metaphor: the troops were looking directly for leadership from those who seemed to have forged new paths. Looking back at the developments leading up to that extraordinary moment, Kasimir Malevich could easily agree: 'cubism and futurism were revolutionary movements in art, anticipating the revolution in the economic and political life of 1917.'[6] Some artists assumed the active role of leaders and agitators (poet and dramatist Vladimir Mayakovsky declared, 'The streets are our brushes, the squares our palettes')[7] while others sought the shelter of the new state bureaucracies to pursue a more classically modern art of easels and studios. The most ambitious young Moscow artists, the ones most fervently engaged in efforts to build a new form of collectivist subjectivity, formed the journal *LEF* (*Left Front of the Arts*). *LEF*'s programme called for a focus on the nation, but others sought the dissolution of all forms of petty nationalism through an international workers' revolution. The following is an excerpt from *LEF*'s 'Declaration: Comrades, Organizers of Life!': 'So-called Artists! ... Exercise your artistic strength to engirdle cities until you are able to take part in the whole of global construction! Give the world new colours and outlines! ... We summon the "leftists," the revolutionary *futurists*, who have given the streets and squares their art; the *productivists*, who have relied on the inspiration of factory dynamos; the *constructivists*, who have substituted the processing of material for the mysticism of creation ... Down with the boundaries of countries and of studios!'[8]

But if *LEF*'s poets, writers, dramaturges and visual artists were excited by the prospect of a transnational unity with other avant-gardists and 'experimentalists' in the arts (a dream that pervades modernism, with its roots in Enlightenment notions of the 'universal rights of man'), political leaders were more concerned with the pressing

problems arising within the shaky boundaries of the new union of republics. From the beginning, there was division along these lines: *modernism*, as a cluster of avant-garde styles, was associated with *internationalism*, and those who reached outside the Soviet Union's borders; by contrast, *modernization* could be accomplished with (indeed, seemed perhaps to necessitate) more traditional representational art that harkened back to the recognizable vocabulary of a pre-revolutionary past, the vestiges of which might be useful for forging a new national present. Whether modernism could, or should, be kept separate from modernization was at issue. But the avant-garde's long-standing association with bohemia, anarchism, socialism, and other avowedly 'anti-bourgeois' beliefs and practices initially gave practicing avant-garde artists an ideological edge when the tide turned against the czarist *ancien régime*.

Thus, internationalists like Leon Trotsky (whom we might call 'modernists') looked to intellectuals and artists for production of new art forms that might at first appear shockingly new. At the same time, the reins of power were beginning to be placed in the hands of others (whom we can call 'modernizers'), such as Vladimir Lenin, who claimed that that only a small number of Mayakovsky's experimental poems should be published 'for libraries and eccentrics'. Already in *LEF*'s call for the abolition of mysticism and the studio, demarcation lines were being drawn between the respected but increasingly isolated (modernist) artist and the new, collective, materialist, factory-oriented (modernizing) artist of post-Revolutionary Russia. Avant-gardism was not enough (it was argued) as long as it remained isolated in modernism's traditional studio-based *l'art pour l'art* programme. Artists such as Tatlin may have been eager to lead, but not everyone was comfortable with his studio-based visions of 'creating a new world'. Tatlin himself was forced to present his experiments as 'productive' and 'material,' not merely formal or aesthetic. Ironically, the most productive and material of his projects, his most famous and powerfully propagandistic work, was never built.

Tatlin's famous project for the Monument to the Third International (Plate 150) remains the artist's most visionary articulation of modernism's aspiration to create a new world and its subjects (to 'organize life,' as *LEF*'s editors had put it). The models and sketches for this structure present all the complex goals that characterize modernism and the split between its national and international goals. Designed to rise 400 metres above Moscow, Tatlin's tower would have been the tallest structure in Europe, serving as a highly visible emblem of international communism and industrialization. It would have become a landmark and emblem of the young nation. Although it promised to be the most significant monument of the 'heroic' period of Russian constructivism, the symbolic tensions in Tatlin's Tower, as it came to be known, could never be resolved, and it remains a ghost of modernism's lost visionary past.

The most obvious initial sources for Tatlin's tower are the period's cutting-edge engineering technological advances, such as those employed by engineer Gustave Eiffel to commemorate the centenary of the French Revolution in Paris some 20 years earlier. Indeed, when it was first displayed, Tatlin's model bore a banner reading 'Engineers, create new forms!' But appropriately enough for a former icon-painter who would communicate to a nation formerly unified (if only tenuously) by religion, Tatlin's tower makes a biblical reference as well. In its slightly tilted, spiralling form, there is a suggestion of earlier artists' visions of the tower of Babel, particularly the spiralling version painted by the sixteenth-century Netherlandish master Pieter Bruegel. The amalgamation between industrial forms and biblical Babel is telling, for it summarizes European modernism's aspirations for a global future and its inevitable ancient entanglement in multilingualism. In the biblical tale and in subsequent legends, Babel was the bustling home to a thousand incompatible tongues, an early metropolis whose ambitious leaders aimed to rule through impressive architecture – an act of hubris eventually punished by God. Paris's Eiffel Tower was regarded with a combination of envy and outrage by revolutionary Russians, who felt it demonstrated similar hubris. In a poem titled 'Paris,' Mayakovsky urged the Eiffel Tower to relocate to the true home of revolution, for

> Here you are far much more needed.
> Steel-shining, Smoke piercing,
> We would greet you.

Consequently, the appropriateness of Eiffel's modern style for the brand of international communism supported by Tatlin was called into question. Both Babel and engineering marvel, Tatlin's tower teetered on the edge of a god-provoking hubris (100 meters higher than Eiffel's tower, and more functional as well). Not surprisingly, Mayakovsky greeted Tatlin's tower with exhilarated approval, as 'the first monument without a beard' and 'the first object of October'![9]

Tatlin's aims for the tower shifted from a national to international scope over time – from its beginnings as a planned monument to the Russian Revolution, it became a bold declaration of solidarity with the international goals of the Communist party. Tatlin's tower was commissioned as part of Lenin's 1918 Plan for Monumental Propaganda, in which czarist monuments were to be destroyed and replaced by revolutionary monuments. Hastily installed realistic monuments with plenty of beards were soon erected in squares throughout the union – but Tatlin, as head of the Moscow division responsible for implementing Lenin's plan, submitted a very different proposal. Rather than abide by the rules of the existing bureaucratic state jury system, he advised adopting an 'international review' of outsiders to choose among competitors to build 'free monuments in a socialist state'. He called for a buffer of foreigners to mediate between the 'nation' (or union of republics) and an 'international' vanguard art community. According to Tatlin's vision, the resulting structures would not only celebrate the Russian Revolution (as Lenin desired), but would also serve as pioneering examples of a radically international commission system. They would be 'monuments to a relationship between the state and art that has not existed until now'.[10]

This new relationship – which remained unrealized, since neither tower nor international review panel materialized – would have reversed the customary power relationship between patron (state) and commissioned artist (much as it reversed prevailing modernist idioms of a structure sheathed in a skin of glass). Loaded with broadcast technologies and outfitted with constantly rotating glass rooms for 'agitation' sessions and propaganda, Tatlin's structure would indeed have opened a new path. Rather

than a vehicle for the nation's voice, the independent modern artist according to Tatlin's vision spoke both to nation (through Russian-language propaganda) and to the world at large, through an international vocabulary of forms and cutting-edge technologies. Choosing to emphasize the future rather than to commemorate the past and to celebrate Russia's significance for the world rather than its intrinsic meaning, Tatlin reconceived his project sometime in 1920. It would henceforth serve as a 'Monument to the Third Communist International,' self-consciously rejecting Lenin's plan for retrospective commemoration and proposing instead a sign of the future, a dynamic transmitter of revolution whose form and programme would reach across the union's borders to ignite the world.

Scaling his Babel to the universe, Tatlin designed the tower's separate levels to rotate at different cosmological and historical speeds, with the top section, 'which rotates at the speed of one revolution per day,' reserved for projections onto clouds, the transmission of worldwide telegrams, radio broadcasts, and the production of 'proclamations, pamphlets and manifestos – in short, all the means for informing the international proletariat'.[11] It seemed obvious to Tatlin and the other visionary members of those calling themselves 'avant-garde' that the only truly international formal language, the only sign system that could transcend Babel's curse of linguistic incommensurability, would be found not in oil paints and canvas, but in the impersonal hum of a dynamo or an oil derrick tuned to a universal pitch.

The stamp of Euro-American sensibilities can be discerned in the tower's struts and radio antennae, which undoubtedly echoed the particular 'rotational hyperboloid' ships' masts that Tatlin would have seen when he served in the merchant marine from 1902 to 1908 (these fashionable American structures, with their twisting, conical openwork for rigging and equipment, were incorporated with much fanfare onto two Russian dreadnoughts in 1911). At the time, such engineering forms were thought to be free of 'national style'. Neutral, functional, and 'scientific', they had no apparent typologies of ornament that would have pinned them to a provincial or national context. Yet lingering anxiety about their 'American' origins would haunt artists borrowing industrial forms. And even in the example of Tatlin's tower, it became clear that such forms were not devoid of symbolism – national or otherwise. Their very 'stylelessness' became symbolic. The techno-scientific modernism inherent in engineering motifs, although not sufficient to secure success for Tatlin's vision of a 'free art in a socialist state', was clear to Tatlin's supporters, as suggested by Victor Shklovsky's comment that Tatlin's tower was built of 'iron, glass, and revolution'.[12]

When German avant-gardists celebrated Tatlin at the Berlin Dada Fair in 1920, they drew similar conclusions from the structure's implications for art, holding up a poster that read: 'Die Kunst ist tot – Es lebe die neue Maschinenkunst TATLINS' ('Art is dead, Tatlin's new machine art lives'). But as dadaists themselves realized, this interpretation of the revolutionary implications of the 'art of the machine' was a conscious attempt to impose the stamp of 'revolution' on forms that could also be perceived as the results of very different types of economic governance (e.g. parliamentary democracy, or industrial capitalism). At the very least, such industrial forms were already deeply associated with capitalism's dynamic upstart, the United States and its Taylorism and Fordism, which were viewed with

ambivalence in the USSR. This problem emerged immediately after the Russian Revolution and was clearly stated in nationalistic terms – how to modernize the Soviet Union without Americanizing it? The problem influenced Tatlin's choice of an engineering vocabulary. Particularly when tied to abstraction, issues of industrialization became divorced from the production lines and electrification programmes that Lenin endorsed (modernization) and entered more symbolic realms (modernism). Thus one critic derided Tatlin's designs as 'super-American urbanistic plans, in which all houses would give way to Tatlinian towers'.[13] Mayakovsky struggled to save the symbols of modernization from such representations by 'primitivizing' their perceived American sources (a classic modernist move, as we have seen). Just as Picasso incorporated 'savagery' and 'exorcism' from African art in order to minimize his aesthetic and conceptual debt to their forms, so Mayakovsky mocked American technological modernism in order to make it possible for the more highly evolved communists to appropriate it: 'No, New York is not modern.... Mere machinery, subways, skyscrapers and the like do not make a true industrial civilization ... [New York] is a giant accident stumbled upon by children, not the full-grown, mature product of men who *understand what they wanted and planned it like artists*. When our industrial age comes in Russia it will be different – it will be planned – it will be conscious'.[14]

Perhaps the 'mature' use of industrial tools could be seen as scientific, progressive, and neutral, but clearly the use of symbolic industrial forms (even if 'planned ... like artists') still provoked some anxiety not only in Russia, but throughout Europe. In France it was dubbed *americanisme*, in Germany, *Machinenkunst*. Everywhere the appeal of this mechano-morphic vocabulary was tempered with a fear that identities (national, cultural, ethnic, individual) might simply disappear in the new technological blast furnace of (mostly American) engineering. Mayakovsky's famous manifesto demanding that the Russian classics be 'thrown overboard from the steamship of modernity' echoed appeals from other parts of the world where artists felt burdened by European traditions. But each of these appeals simultaneously revealed a growing nationalist anxiety. Could metaphors of modernist steamships be dissociated from America's growing dominance among the fleets of 'titanic' luxury crafts? In throwing off the classics, would the cultures in question simply be exchanging one local variety for another (albeit a more technological one)? Italian futurists, British vorticists, German Bauhaüsler, and international dadaists all looked to the machine to demolish a burdensome past and to jettison the worst of their national traditions. At the same time, those banned national traditions often appeared as stowaways on 'the steamship of modernity' – vernaculars that seem to constitute the discourse of nation underlying the Babel of modernism's international speech.

## Techno-scientific modernism and the nation state

As in the case of Tatlin's Monument to the Third International, the scores of movements that embraced different aspects of an industrial style in the 1910s and 1920s sparked a great deal of anxiety over the appropriate role of this new style in the modernization of the nation state. Did

the adoption of new technologies require a new type of subjectivity? Would a new form vocabulary and a new relationship to materials be needed to build a new industrialized society? Were the capitalist entrepreneurs of the United States, who expanded the technologies of industrializing Europe, merely ignorant children (as Mayakovsky had implied)? Or was there something dangerously sophisticated in their technological 'play', something endemic and pernicious in the systematization, routinization, and mechanization that Fordism and Taylorization required?

Artists addressed these questions early on. Often living quite literally in the social and geographical fringes of the developing urban centres, the avant-garde cultivated a sort of alienation resulting from a sensitivity to the boundaries between nature and culture, city and country, human and machine; such contrasts were particularly evident in the periphery of urban centres during and after the Industrial Revolution. Clearly, not all artists welcomed the evident inevitability of the Machine Age. Even those who sought to participate in an international avant-garde did not agree on the ultimate benefits of modernity's infatuation with technology.

Artists outside France, in particular, developed avant-garde movements that actively resisted technological modernism – but they nonetheless participated in the radical formal experiments of their time. Non-objective painting, for example, was developed by Tatlin's contemporary, Russian-born Wassily Kandinsky, who taught in Munich and developed a theory of 'spiritual' resonance for certain forms and colours that were believed to take the soul to a higher plane of existence. Coming together under romantic titles such as *Die Blaue Reiter* (The Blue Rider) and *Die Brücke* (The Bridge), other artists (known collectively as 'German expressionists') took the modern fascination with 'primitive' art to a new level, where the art of children and Africans were both seen as signposts of a sought-after purity and antidotes to the technological city-system. 'The African considers his idol the comprehensible form … of an abstract concept' wrote the Munich painter August Macke, 'Everywhere, forms speak in a sublime language right in the face of European aesthetics. …The joys, the sorrows of man, of nations, lie behind the inscriptions, paintings, temples, cathedrals, and masks'.[15]

The 'joys and sorrows … of nations' were of great interest to artists in Germany, a country whose status as a nation was so recent, and apparently in desperate need of symbolic reinforcement. Philosophical traditions of German idealism permeated the German expressionist painters' resistance to techno-modernism and motivated their search for purity in nature and 'the primitive'; such themes also resonated with the long drive towards cultural nationalism that had begun in the eighteenth century in the writings of Johann Gottfried von Herder. The intellectual dominance of France had for centuries stimulated the various German-speaking nations' interest in Enlightenment rationalism. Intellectuals in the young German nation correspondingly rejected the 'top-down' rationality of technology and engineering (supposedly dominant in France), and artists celebrated the 'bottom-up' primitivism of France's colonial 'others' (Africans) and Germany's own 'natives' (*das Volk*). This of course created considerable tension since the forms used by the German expressionists were occasionally borrowed from other peoples' visual culture (particularly Africans'), rather than

from some rediscovered native German idiom. As the painter Emil Nolde speculated in 1912, 'Absolute originality, the intense and often grotesque expression of power and life in very simple forms – that may be why we like these works of native art'.[16] But maintaining their interest in African art forms (standard procedure for would-be-modernists in the early part of the twentieth century) would prove dangerous for modern artists in interwar Germany. The search for appropriate forms of cultural nationalism became politicized by the Nazis in the 1930s, and primitive modernism was excoriated and banned. In spite of his membership in the Nazi party, Nolde, like others in the German expressionist movement, was among the artists whose works were featured in the famous *Entartete Kunst* (Degenerate Art) exhibition of 1937. Although Nolde endured, others were forced to emigrate, perpetuating the nomadic character that was seemingly endemic to modern art.

Those who took the route of a more technologically oriented modernism fared no better under the pervasive grip of German fascism. Artists of the progressive Bauhaus school for architecture and applied arts were also forced out by the Nazis. But the Bauhäusler were condemned as 'bolshevists', whereas expressionists had been deemed atavistic. Expressionists had been ridiculed, but the Bauhaus artists were genuinely feared. The very *inter*nationalism of the Bauhaus drew the fascist leadership's wrath and provided a political entry point for the Nazis' attacks. Modern engineering technology was not the problem; rather how to apply it to nativist philosophy became the ideological challenge.

The Nazis' use of machine imagery was complex. They militarized bodies into machines, designing exercise regimens and marching formations that emphasized a hardened and regulated masculine physique, arranged like war material. Yet at the same time, the Nazi leadership derided Bauhaus artists' stripped-down mechano-morphic functionalism as 'pan-Semitic' and 'non-Aryan'. Ultimately, a tenuous balance was achieved between the nationalist (racist) claim that Teutons were the first technicians, and an aesthetic programme of old-fashioned representational art. Elsewhere in Europe, machine styles would be deployed more consistently in navigating the national/international currents of modernism, even if they often had to reckon with the mass culture of the United States.

Machine-age New York fuelled many early twentieth-century machine styles, particularly as the dislocations of world war (and later fascism) made it a haven for foreign émigrés. Cuban-French painter Francis Picabia made the following statement on his first trip to New York (where he ended up after defecting from the French Army): 'Almost immediately upon coming to America it hit me … The machine has become more than a mere adjunct of life. It is really a part of human life … perhaps the very soul … I have enlisted the machinery of the modern world, and introduced it into my studio.'[17]

Together with French artist Marcel Duchamp (who had given Picabia one of his own early machine-paintings: a cubist-inspired work featuring mechanical and biomorphic elements and dubbed *Mariée [Bride]*), Picabia defined a new and harsher modern sensibility via the machine. Initially, this new sensibility was perceived to be American, yet wittily erotic: one 1915 line drawing by Picabia depicts a sparkplug as a nude young American girl; Duchamp's famous 1917 'statement' was an up-ended piece of American

plumbing, a urinal dubbed *Fountain*. Another object to emerge from the avant-garde was a collaboration between the expatriate Baroness Else von Freytag-Loringhoven and an American painter named Morton Schamberg: a length of curving plumbing placed in a mitre box, titled *God*. In phase with anarchist artist groups in Zurich and Berlin, the Manhattan clique were later celebrated as 'New York dada,' while European dada explored the 'anti-art' implications of *Machinenkunst*. But as scholars have noted, most native-born Americans eschewed these metaphoric manipulations of their machines, depicting industrial objects in a way that claimed the crisp lines and exaggerations of scale found in commercial advertisements – but with less of the Europeans' irony, gender play, or subversive intent. Inevitably, the foreigners at the heart of 'New York dada,' and affiliated dadaists elsewhere, would each present variations on the mechano-morphic theme that counteracted or echoed their national affiliations and anti-nationalist commitments. Most pursued an ambivalent love affair with things mechano-morphic and American, but as in the subsequent surrealism movement, their works seemed largely to neutralize any claims of 'nation' through an unremitting eroticism or direct and furious anarchist critique. Some dada artists fused the primitivism of an earlier modernism with more up-to-date technology. Note, for example, the collages of Berlin dadaist Hannah Höch, who combined ethnographic photographs of African masks and corporate logos in her montages. Rather than replace the government or form its new citizens, the anarchist modernists who came together through dadasim sought to revolutionize the individual human imagination and to render it less vulnerable to the claims of the bureaucratic nation state.

A less critical re-use of machine forms and of nation emerged from the Italian futurists, who adopted mechano-morphic images and nationalist rhetoric with a vengeance. Former symbolist poet Filippo Tommaso Marinetti inaugurated the movement in his extraordinary *Manifesto of Futurism*, published in the Paris newspaper *Le Figaro* in 1909. Fusing a celebration of the machine with a repudiation of the classical legacy, Marinetti wrote: 'We affirm that the world's magnificence has been enriched by a new beauty: the beauty of speed.... a roaring car that seems to ride on grapeshot is more beautiful than the *Victory of Samothrace*. ...We will destroy the museums, libraries, academies of every kind ... Museums: cemeteries!'[18] Like Picasso, Marinetti staged his attack in France's cultural capital, the very city where the Hellenistic statue from Samothrace was enshrined (at the Louvre in Paris). And like his Spanish predecessor (Picasso) and German contemporaries (Nolde, Höch), Marinetti looked to Africa in his search for modernism's future. Describing the automobile excursion that propelled him toward revelation even as it landed him in a ditch, the presumptuous futurist merged a tribute to factory discharge with a memory of his African wet nurse: 'O maternal ditch, almost full of muddy water! Fair factory drain! I gulped down your nourishing sludge; and I remembered the blessed black breast of my Sudanese nurse.'

Italy, like Russia and to a certain extent Germany, was at the fringes of the rapidly developing European centre, becoming 'ethnic' in comparison with the colonial ambitions of a France or England (with none of the past imperial glories of Portugal, Spain, or the Netherlands), playing 'catch-up' with its own imperialist forays into Libya and Ethiopia. At the time of Marinetti's writing, there was

already a tenuous Italian presence in the Anglo-Egyptian condominium over Sudan, through Roman Catholic priests who had established missions in the southern region (where tribal black Africans were the primary inhabitants, rather than the more urban Arab Muslims in the northern Sudan). These church missions maintained the few schools and organizations that linked the south with Europe (otherwise closed by Britain from trade and communication), and it is likely that Marinetti's childhood nurse came to Italy thanks to these missions. In his exhilarated narrative of 'baptism' after his car crash, Marinetti smashes together mothers, machines, and borders, combining the person of a 'blessed' but colonized 'other' with the dark flux of Italy's lurching modernization (waste in a factory ditch). Unlike the critical, anti-state anarchism of the (northern) European dadaists, Marinetti and his futurist followers crusaded on behalf of Italy's expansionist policies. Initially anarchists, they eventually became fascists. Yet even in that first epiphanic (and anarchist) moment, national aspirations are mixed with concerns about border dwellers (Italian or Sudanese) and dreams of transcendence (technological). As we have argued, modernism embraces varying impulses toward and away from national cohesiveness. Italian futurism brought these issues sharply into focus.

The visual forms spurred by Marinetti's futurism deeply influenced Russian constructivism and even helped to spread cubism. Marinetti wrote: 'we will sing of the multicoloured, polyphonic tides of revolution in the modern capitals; we will sing of the vibrant nightly fervour of arsenals and shipyards blazing with violent electric moons ... and the sleek flight of planes whose propellers chatter in the wind'.[19] The works of futurist artists, such as Carlo Carrà and Umberto Boccioni, illustrated Marinetti's spirited appeal by depicting urban scenes and objects with broken forms and surfaces that appeared whipped by wind or pierced by analytic rays. Often composed with predominantly curving, diagonal 'force-lines,' futurist paintings drew upon the decorative arts' preoccupation with streamlining and abstract repetitive forms. Dynamic forces and events were expressed with brushstrokes divided into scintillating flecks of colour, and different moments of daily life were depicted simultaneously. Both characteristics bore a French pedigree: the style borrowed elements of French divisionism and pointillism, and the simultaneousness echoed French philosopher Henri Bergson's famous theories of flux and becoming. In modernizing Italy, however, these artistic and philosophical commitments took on an enthusiastically technological and nationalist twist. 'Who can still believe in the opacity of bodies,' asked Boccioni and the other futurists, 'since our sharpened and multiplied sensitiveness has already penetrated the obscure manifestations of the medium?'[20] This sharpened and multiplied sensibility was initially mobilized for anarchist ends, although war was, from the beginning, glorified as the 'sole hygiene of the world', and some of the futurists' artistic activities included demonstrating against neutral alliances. When the futurists' calls for intervention met with success, and Italy joined the war against Germany, futurist artists committed themselves to profoundly nationalist ends – as became explicit in the futurist journal *Lacerba*, which concluded its last issue in 1915 with the statement: 'From this moment on, we are one thing only: Italians'.

The new commitment to Italy's role in an international theatre appears most notably in Carlo Carrà's works of

1914–1915, such as a line drawing he titled *After the Marne, Joffre Visited the Front in an Automobile* (published in March 1915 as part of his bellicose book *Guerrapittura*), and the complex composition known as *Manifestazione interventista (Interventionist Demonstration)* (Plate 151). In the line drawing from *Guerrapittura*, Carrà celebrates the victories of French Marshall Joseph Joffré, who had triumphed over the Germans in the battle of the Marne in 1914 – a futurist-looking cone (Joffré's 'penetrating angle') aims at a pair of dour-looking parallelepipeds, themselves connected by dotted lines to a sinister black Iron Cross. The more complex and slightly larger work (also translated as *Interventionist Manifesto*), shows Carrà drawing heavily on the new technique of cubist collage, which he had observed that spring after visiting Paris (and Picasso). Yet in place of analytic cubism's stable triangular compositions that allude to the framing edge, Carrà's small collage seems to explode outward from the centre (like Bernini's great Roman altarpiece, the *Ecstasy of St Teresa*), threatening to violate the boundaries of its support. Indeed, other futurist works follow exactly this formal strategy (notably, Giacomo Balla's *Abstract Speed + Sound*, from 1913–1914, or Gino Severini's *Plastic Rhythm of July 14th* from 1913) – the internal, painted compositions of these futurist canvases are extended beyond the frame with diagonal lines and licks of paint. In his *Interventionist* collage, Carrà stops short of moving beyond the frame. But his image nonetheless produces all of the expanding, propulsive energy of the typical futurist canvas. What few horizontal bits of text there are (i.e. 'Piazza' and 'Strada', 'geometriche città moderne' and 'Rumori') seem lost in a helical vortex that expands like a blast from a megaphone, a rapidly cycling airplane propeller, or an oncoming train.

Despite Carrà's inspirational stay in Paris, after which he strongly suggested to his friend and fellow futurist Severini that 'We should … transfer our tents to this capital of the world,' he was also tempted to carry on his struggle in Italy, as the *Interventionist Manifesto* (completed in July after his return) attests. More futurist and nationalist than most of his other works, Carrà's collage seemingly anticipates Marinetti's injunction later that year to 'try to live the war pictorially'.[21] The word *Italia* is at the very centre of the swirling collage, with '*audacia*' directly above it; *evviva* (hurrah!) circles the centre in expanding rings of highly visible white lettering on a black ground. Italian flags crop up, and a tricolour scheme is repeated throughout.

But the image is more than the sum of these celebratory nationalist bits. First of all, the overall tricolour scheme is *not* that of the two small Italian flags, which lie flat in rectangles of requisite green, white and red. In the dynamic composition around these small, somewhat subordinated national icons, the dominant colours are *black, yellow* and *red* – a clear reference to the German flag. Supporting this reading, directly opposite one of the Italian flags is the large German word 'TOT.' The other flag is associated with the English word 'SPORTS.' Small newsprint clippings of a flower, a boot, a bowl of fruit, a marching drum appear to be meaningless, yet they reinforce the visual rhythm of the work, which constitutes a blast of contrapuntal letters, forms, and colours that defy a linear 'reading.' The verbal/formal vortex is the visual equivalent of the bellicose poems and manifestos of futurism's literary production.

In the *Interventionist Manifesto*, Carrà explicitly refers to these poems and labours to establish a sort of visual onomatopoeia, particularly Marinetti's *Zang Tumb Tuum*, the 1912 war epic whose title was intended to evoke the sound of exploding shells. Published in an innovative typeset edition in 1914 and excerpted in *Lacerba* (whose title makes its own appearance at the upper left of Carrà's composition), the title of this work appears along the upper left diagonal of Carrà's collage. Clearly, Carrà's inflammatory collage was inspired by Marinetti's poetry. Like the Futurist Manifesto, the text of Marinetti's *Zang Tumb Tuum* was originally written in French, implicitly appealing to the French modernist tradition as exemplified by the poet Stéphane Mallarmé. Marinetti had explicitly attacked Mallarmé in his 1913 broadside the 'Destruction of Syntax'. In opposition to Mallarmé, Marinetti called for a dramatic public performance of poetry; indeed, after translating his noisy poem into Italian, Marinetti performed portions of it in public no fewer than twenty times from 1913 to 1914.[22] The themes we have examined in the struggle between modernism and modernization were acted out yet again, in this movement from private to public. Marinetti rejected what he saw as the intensely individualistic and internalized symbolist aesthetics of French modernism, seeking instead an immediate public impact upon his culture, as incontrovertible as modernization, as direct as war. Marinetti attempted to duplicate the chaos and cacophony of his public readings in typographic form by using chaotic page design and a motley variety of typefaces. Following his own manifesto for the 'Destruction of Syntax', he used verbs only in the infinitive, isolated adjectives from nouns, mixed font sizes and scattered words and type across the page. Through these disjunctions and affronts to the reader, Marinetti sought to deny what he called the 'literary I', and replace it with a new futurist subject, a 'multiplied man' of restless and mobile attention, not *ego* but *ago* (the Italian word for a mechanical pointer or indicator needle on a measuring device).

Carrà's small collage did not lend itself to the same kind of performance as Marinetti's poem, but its intent was similar. Like the Soviets, Carrà and the other futurists yearned to harness the growing power of the mass media: newspapers, posters, and advertisements that would carry more than mere advertisements. But the futurists as yet had no overall international politics to which they could attach their ambitious formal experiments – no Communist International offered to take their forms beyond the Babel of competing nations and foreign tongues, no skyward-reaching towers rose to take them to the global aerial perspective. The futurist model, then, remained a Nietzschean one – a theatre on the ground (its actors mired, perhaps, in Marinetti's factory ditch) in which the agonistic choices were, to quote Mussolini, to 'march, or rot.' The nearly hopeless disparity in power between the aspiring Italian nationalists and their big brothers to the northeast was signalled in Carrà's own collage. It is the colours of the German flag that form the larger compositional vortex within which the small Italian *tricolour* must swim (or sink) – a sense of national doom that seemed prescient, in retrospect. For after enthusiastically signing up for that great 'hygienic' conflagration, scores of Italian futurist painters and poets met their end in the ignominious trenches, including the great sculptor Umberto Boccioni, and the visionary architect Antonio Sant'Elia. The enthusiasm for Fascism manifested by those who survived the Great War has rendered the legacy of Italian futurism troubling for most historians of modern art.

The Fascist leanings of the futurists should not surprise us, however. Fascism in Italy, which preceded the rise of the Nazi regime in Germany by a decade, was both more tolerant of aesthetic diversity and more tolerated by intellectuals and artists of all varieties. As scholars of modern Italian art have argued, Fascist culture *was* Italian culture during the *ventennio* (the Fascist party's two-decade rule), dominating all public discourse and supporting styles as diverse as geometric abstraction, futurism, expressionism, and neoclassical academic painting. Even the still-life painter Giorgio Morandi, beloved by moderns for his 'devout study of slight yet critical shifts in the weight of counterbalancing forms,' placed his unassuming art at the service of the *Strapaese* (*stra* + *paese*, or 'supercountry') movement, one of the most important rural branches of Fascism. *Strapaese* fought for the protection of the traditional 'expressions of the race', as Fascist Mino Maccari put it, preserving these racial traditions from corruption by 'fashion, foreign thought, and modernist civilization'.[23] The taint of Fascism cannot be used to condemn all Italian moderns and anti-moderns. The point is to refuse once and for all the equation of modernism in the visual arts (or anti-modernism, for that matter) with internationalism, progressivism, or left-wing avant-gardism. Both modernism and its opposition have always depended on the political context and been interpreted on a local level. For the purposes of this chapter, we can simply assert once again that wherever it appears, modernism is permeated with the local and specific politics of nationalism, a dominant twentieth-century discourse with which all artists contended through the century, with varying degrees of consciousness and/or success.

Whether grounded in nationalism or aspiring to internationalism, modern artists remained conflicted in their hopes throughout this period. Tatlin, either consciously or unconsciously, had inscribed Babel in the form of his International monument, and Carrà, too, summoned linguistic cacophony and played out the struggle of national wills in his visual manifesto. The only generalization that can be made to characterize the historical development from the moment of *Les Demoiselles* to the First World War period of Carrà's *Manifesto* and Tatlin's post-war monument, is that there seems to have been a movement from Picasso's individualized theatrics – his performance of alternately gendered, racialized, and nationalized identities – to Tatlin's and Carrà's more collective aspirations. Envisioning Babel or a theatre of war presupposes a collection of voices, none of which can speak for the multiplied and assembled subjects of the modern urban city or the nation that proposes to contain them.

## Internal exiles: surrealism and the public mind

In 1929, a group of artists, writers, and intellectuals published the 'Surrealist Map of the World' in the French revue *Variétés*. Map-making is a quintessentially nationalist project, but the surrealists attempted a critical inversion. The equator, an imaginary line defined as the great circle around the Earth's circumference, is here a meandering path that curves below 'Hawai' (sic) and above 'Archipel Bismarck.' While the northern hemisphere still dominates, the United States disappears entirely, squeezed between Mexico, Labrador, and an oversized Alaska. Only two cities – Paris and Constantinople – are visible, but their countries cannot

be identified, crowded in the one case by Germany and 'Autriche-Hongrie,' in the other by Russia and Africa. The African continent itself is surprisingly small in the surrealists' map, considering its importance to the earlier cubist painters (and its appearance in the futurist Manifesto in the person of Marinetti's Sudanese nurse). Although the terms *l'art primitif* and *l'art negre* were still used fairly interchangeably (neither making the distinction between objects originating from Africa and Oceania), the balance had clearly shifted in the tastes of Western artists. Henceforth Oceanic cultures assumed far greater importance. Surrealists disdained what the cubists had found in the largely monochromatic sculptural traditions of Africa. Instead, the reigning artists and intellectuals of the 1920s conceived a passion for the intensely symbolic, allegorical, and polychromatic decorations from the Pacific Rim.

Reflecting Europeans' obsession for these so-called fetishes (objects of trade, worship, and everyday use produced in supposedly 'primitive' societies), the surrealist map emphasizes the lands of these faraway people and objects. The surrealists' universe orbits around the Marquesas, the Solomon Islands, the New Hebrides, the Philippines, and New Guinea (all named not by the people who lived there, but by the conquering colonials who mapped them); islands known by more exotic names are also featured: Timor, Bali, Java, Sumatra, Borneo, Celebes.

Celebes is unfamiliar to the present-day reader. Better known to its inhabitants as Sulawesi, Celebes was the name Portuguese traders gave to this island in the eastern part of the Malay Archipelago (now part of the Republic of Indonesia). The name was probably coined from a Latinate root (*cele*) meaning 'secret,' but it also evokes an obscure Old English word (cele/ceil/seal) for 'happiness' as these two attributes of tropical life were most appreciated by modernist artists (from Paul Gauguin and Emil Nolde to the surrealists). Some actually came in person to such island sites, following droves of colonial soldiers and administrators, church missionaries, European anthropologists, adventurers and government trade officials. But most artists never attempted to actually see such places firsthand. Their experience ended with the exotic flavour of names and objects brought to 'the centre' (whether that centre was constructed as Paris, Berlin, Amsterdam, Vienna, or Zurich) – objects such as masks, architectural and nautical ornaments, clubs, staffs, kitchen implements, and occasional free-standing figures surrounded by rumours, anthropological treatises, and printed images of distant people and beliefs. Celebes was typical, then, in being known by most Europeans first as a faraway place, second as a cluster of exotic people and rituals, and lastly as a particular style captured by artists.

Certainly Max Ernst had never visited the actual island of Celebes/Sulawesi, and probably had little sense of the objects it might have produced, when he titled a 1921 painting *Celebes (Der Elefant von Celebes)* (Plate 152). At a time when the anarchic energies of dada had begun to subside but the goals of surrealism had yet to be formally articulated, and when the seemingly senseless destruction of war had only barely given way to the exhausted despair called peace, the painting presented an imaginary world that turned away from politics toward a different, purely psychological concept: the dream.

The dream acquired a special status at the time – not merely among proto-surrealists such as Ernst, but among

legions of anthropologists, psychologists, and philosophers of the industrialized West (the ones writing about the distant cultures they termed 'primitive'). Writers such as James Frazer (*The Golden Bough*, 1890) and French anthropologists such as Lucien Lévy-Bruhl (*La mentalité primitif*, *How Natives Think*, 1910) shared a conviction that dreams provided a window onto a spiritual universe that had once been common to all humans (the 'primitive' supposedly preserved a link to the spirit that had been lost in the progression toward modernity). Sigmund Freud's *Interpretation of Dreams* (1905) and *Totem and Taboo* (1913) drew on Frazer and Lévy-Bruhl. Freud combined anthropological research with his own medical training, positing relations between newly identified structures of the individual mind (the unconscious and subconscious), which he linked to an earlier 'primitive' mindset revealed by dreams. In the unauthorized extension of these theories by Freud's apostle (and later apostate) Carl Jung, the narratives constructed by the dreamer were linked to a 'collective unconscious' that could somehow be shared (and understood) by all of humankind. The tension between these two views of dreaming – as a deeply private affair or as a universal image-based language – characterized surrealism from the beginning and underlined its ambivalence toward that other partial universalism: nation.

As a young German university student reading psychology and philosophy in Bonn before the outbreak of war, Ernst was familiar with these competing theories of culture and mind. He was drawn to the sciences of the mind because of their attempts to understand dreams, seeing them not (as the Romantics and symbolists had) as a source of poetic imagery, but in a new and rational way. Perhaps the young Ernst also hoped to resolve some of his own problems, stemming from an unhappy childhood marred by an autocratic father and the death of a sister (in later memoirs he acknowledged as much). Throughout his university career, Ernst the young rationalist also painted, wrote art reviews, and began to contact other young artists publishing in the Berlin journal *Der Sturm*. Then his world suddenly collapsed. War was declared: 'Max must enlist. Field artillery. Four months in [barracks] then out into this shit.' Ernst's sense of the total collapse of rationalism in the madness of world war is captured in such later autobiographical musings as: 'Max Ernst died on 1 August 1914. He returned to life on 11 November 1918, a young man who wanted to become a magician and discover the myths of his time.'[24] For a former lieutenant promoted from the ranks of the Totenhopt Husaren (Death's Head Hussars), magic and myth came to seem far preferable to reality – whether it be the remembered reality of war, or the post-war reality of British-occupied Cologne.

The declared goal of magic and myth was close to dada, a new movement with whose founders Ernst had been friends before the war, and whom he now called 'Dadafex Maximus' ('Dadamax' for short). Dada's left-wing nihilism had emerged in a neutral Switzerland in 1916. It then erupted in Berlin (where its members risked imprisonment and death during the war) and had a brief New York episode. Although initially quite political, the ex-soldier Ernst loosened Dada's bulldog grip on the real world's insanity, substituting a more inner-directed search for another world. When he first exhibited the new paintings – including *Celebes* – in Paris, he described his new strategy of interiority as 'mise sous whisky marin,' viewing the world as if from an inebriating, disorienting sea.[25] Such sentiments could still resonate with Ernst's old friend Hans Arp's statement that dada hoped 'to do away with fraudulent reasonableness and substitute the natural, unreasonable order of things'[26] – but Ernst's unreasonableness aimed neither at visible nature, nor at the 'real'. Reality, in his post-Freudian view, was precisely the problem. *Celebes* aimed to make visual the parapraxes and narrative disjunctions that the psychoanalyst uses to probe beneath the illusion of the real, to assist the patient in arriving at the underlying pathology of his suffering. Ernst contributed by making the emerging vocabulary of psychoanalysis a central part of what would become the canon of surrealistic painting. Within the leap from private psychological significance to public art, the discourse of nation would return.

Ernst painted *Celebes* three years before poet André Breton published his 'official' Surrealist Manifesto, and it played a key role in forming the sensibilities of the writers and thinkers who came to support the movement. (Indeed, Ernst's collages had been the subject of Breton's first essay on art in the spring of 1921.) In the 1924 manifesto, Breton called for 'Psychic automatism in its pure state … Dictated by thought, in the absence of any control exercised by reason, exempt from any aesthetic or moral concern'.[27] Ernst never achieved the free-wheeling appearance of automatism in his art (and is therefore consigned in the Manifesto to a supporting role, one of the many precursors who retained 'a certain number of preconceived ideas' and failed to '[hear] the Surrealist voice').[28] Nonetheless, his painting was so resonant with the developing tenets of surrealism that when the young French poet Paul Eluard saw it during his first meeting with Ernst, he bought it immediately. Eluard became the first person to purchase a work by the 'Dadamax' from Cologne, transporting tangible proof of Ernst's private/public vision to Paris.

Despite Eluard's endorsement of Ernst as a painter of the future, *Celebes* turns its back on the major innovations of modernism as developed by the cubo-futurists. The painting resorts to the devices of academic realism to construct a kind of landscape. This comes as a surprise in any progressive account of modern art. In such an account, the cubists' fragmented and flattened space became further pulverized by the Italian futurists, until, as we saw in Carrà's pasted-paper assemblage, the picture plane was an explosive, centrifugal metaphor for the theatre of war itself. Moving up in a twisted spiral in Tatlin's tower, or expanding outward from the compressed and flattened plane in futurism, modernist space before surrealism was shallow and dynamic. Suddenly, in Ernst's paintings of 1921, it became frozen and still. In the sombre quiet of this post-war canvas, Ernst made no effort to resurrect a fallen hero, or even nostalgically to mourn one. Indeed, the first look of *Celebes* reveals an enormous and enigmatically obscene rump. Whatever sense we may now make of it, in 1921 the 'elephant' *Celebes* clearly functioned for Paul Eluard as the perfect emblem of whatever future remained for European culture – behind a figure of mockery (my ass!), the viewer confronted an ambiguous and interior journey, seemingly to the heart of madness and darkness alike.

In the grotesque company of the Death's Head Hussars, Ernst had faced off against Eluard across the lines at Verdun. Yet in their subsequent meeting, there was no need for *détente* for a negotiated amelioration of conflict between *Frosch* and *Boche*. For both artists, the wartime confrontation

stood as a token of the kinds of nationalism that dada, and subsequently surrealism, yearned to destroy. As Ernst experienced it, the imagined unity of Wilhelmine Germany, best expressed by its military, was always already fractured by the cultural rifts between Prussians and Rhinelanders in the ranks, or later, between stay-at-home-patriots and freshly minted anarchists back from the trenches. In Eluard's France, the imagined monolith of French modernism was similarly riddled with social and rhetorical splits between the immigrant artists forming the supposedly *déracinés* School of Paris, possessed by 'crazy' abstraction and expressionist brushwork, and the *terroirs* (native French) realist painters canonized as the true-blooded sons of the *Ecole Française*.[29] In many ways, *Celebes* bridged these gaps on both sides. Its very *anti*-modernism may have helped secure it a foothold in Eluard's (and France's) visual culture, for its air of sober realism (if only in service of an as-yet-unnamed *surrealism*) fit the general 'Return to Order' of post-war painting in Paris, a rejection of the immigrant-fuelled styles of expressionistic abstraction that many Frenchmen felt had 'gone too far'. Similarly, Ernst's stylistic sobriety signalled a turn away from the politics that had characterized war-time dadaism, toward the *Neue Sachlichkeit* (New Objectivity) emerging as Germany's version of a return to order (albeit an order following only the logic of dreams).

The United States also witnessed a turn toward a cooler style, and Italy saw the emergence of a new 'metaphysical realism' in work by Giorgio de Chirico just after the war. Of course, any more-than-cursory inspection of *Celebes* would reveal its complication of the chillingly quotidian verism of *Neue Sachlichkeit*, its contradiction of the optimism of American precisionism, and its rejection of the nationalist values of the *Ecole Française* (the de Chirico paintings Ernst saw in 1919 were the only 'realist' works he acknowledged as deeply influential). But on the surface (the veneer of the painting's smooth finish), Ernst's painting fit the newly hard-edged return to representational illusionism and encouraged the importing and transfer of its more subversive intentions.

Ernst's path to the other world of *Celebes* (and to Paris's international stage) was paved with such stylistic negotiations, reflecting the bitter experience of a disastrous military career defending *Deutsche Kultur*. Wounded twice, the artist miraculously avoided being killed in the slaughter; he made a number of small abstract watercolours referring to the Great War (*Battle of the Fish*, and *The Spindle's Victory*, both from 1917). Disillusionment with the inadequacy of such art in addressing 'reality' (past or present) led to Ernst's few real-world political engagements – such as the moment in 1919 when he stood at the factory gates in Cologne distributing copies of his socialist friend Johannes Baargeld's periodical *Der Ventilator*, or the time the two broke up a reactionary patriotic theatre production, or put up an exhibition behind a urinal, where one of Ernst's works came equipped with an axe to facilitate its own destruction. The restrictions imposed by the British military occupying Cologne (which banned *Der Ventilator*), and the activities of local German police (who closed the exhibition), worked to silence such dada manifestations. Baargeld's and Ernst's provocations had been calculated to stir things up; not surprisingly, the lid came down, and Ernst turned to his 'sous whisky marin'. Thus a certain amount of self-censorship also lies behind the frozen silence of *Celebes*. Without a

doubt, *Celebes* marks the beginning of the end of Ernst's dada period. The turn in the direction of France (and internationalism), validated by Eluard's purchase of the painting, was confirmed by Ernst's own move to Paris shortly afterward.

In art history terms, Ernst's return to academic modes of representation was a rejection of dadaism's cubo-futurist heritage – a move away from the radical, anti-Renaissance flatness of cubism, and a return to modes of composition and illusionism made comprehensible through centuries of Western classical perspective. Crucial in demonstrating the effectiveness of such a reversion, as noted above, was de Chirico's 1912–1918 work, which Ernst considered significant. De Chirico's use of distorted perspective, his depictions of strangely lit empty urban squares, were the product of an Italian interpretation of German thoughts on classical Italian architecture – specifically, Friedrich Nietzsche's descriptions in *Ecce Homo* of the vast empty piazza of Turin. However, where de Chirico relied on the pre-Renaissance cityscapes of Lorenzetti to capture Nietzsche's mood, Ernst retained the narrative disjunctions characteristic of cubism – presumably to connect with a more modern reality. Steeped in dadaist techniques of collage and photomontage, Ernst found the inspiration for paintings such as *Celebes* in cut and reassembled images he took from catalogues, scientific journals, and anthropology texts. Many of these sources filter into our subconscious associations with the picture, and indeed, they may be rendered subconscious (that is, 'invisible') only by the completion of the painting – the smoothing over and erasures resulting from Ernst's use of the traditional painting techniques.

Just before *Celebes*, Ernst produced *Fiat Modes*, a suite of lithographs conceived as a homage to de Chirico. The German war veteran recycled the Italian painter's mannequins and triangulated perspectives, but decorated them with Freudian anxieties. The work poses a question – 'Let there be Fashions,' or, by suggestion, What is the future of art? Like Walter Benjamin's magisterial ruminations on modernism in the nineteenth-century shopping arcades of Paris, Ernst's prints takes place in a dislocated cityscape of transparent shop windows and tilted floors. Mannish suits are measured on female dress forms, a symptom of the changing 'mode' of gender politics and artistic fashions. The dress forms and couturiers cohabit with recombined segments of storefront mannequins (or artists' figurines) and grotesque combinations of stumps and nubs, resonating with Ernst's contemporary works, which appropriated medical images of braces and prostheses. In what is perhaps the most telling page in the *Fiat Modes* suite, a tiny silhouette, marked as female, appears inside an enormous structure (a department store display window?) viewed from a distance by a clownishly fat figure with bare feet and exposed, drooping male genitals. The genitals appear again in place of the nose for this armless figure, referring to Freud's famous study of a patient's psychological associations between nose and phallus in the context of castration anxiety. The man's line of vision is diagrammed, beginning with his limp phallus-nose and following a path set out by a pointing hand, under a banner (painted backwards as a shop sign seen from the inside) that reads: 'zur neuenkunst? D D'.[30]

Is this man speaking to wider issues, such as the future of German (*D*) and possibly also dada (*D*) art? The defeat of

German militarism in the war is suggested in this symbol of deflated masculinity, and castration anxiety is seen as a crisis for the nation's culture. Critiques of nationalist revival (already raised, as we have seen, in Ernst's and Baargeld's disruption of the monarchist play) appear on the cover page of *Fiat Modes*, which features a tall mechanical tower topped with a flag. The theme of manipulated flags reappears here, for this is not the German flag, but a banner bearing a star and a crescent – reminiscent of Muslim symbols on the national flags of Turkey, Pakistan, Tunisia, Singapore and Malaysia. The fragile-looking industrial tower is converted, symbolically, to a minaret. Far from some escape into the maternal-paternal colonialism of a Marinetti (who had linked the black waste from an Italian factory to the breast of his Sudanese nurse), Ernst seems merely to have been reaching for some different flag under which to muster the disaffected troops of the European avant-garde, something other than the German-French-British and sometime Italian and American heraldry so visible during the latest cataclysmic conflict. Ernst's choice of an Islamic other, like his choice of elephants and *Celebes*, is not random, even if its specific significance may be elusive. It is as if by evoking a third reference, he can escape the return of cyclical history. But it remained an imaginary escape in 1919; the tower is a slender tracery of iron, seen from a distance. Before achieving a deeply desired displacement to Paris (and then a move to the American Southwest during the Second World War), Ernst envisioned only internal exile. Confined to Cologne, he could just barely imagine a new (German? or international Dada?) art.

Although Eluard endorsed the internationalism of *Celebes*, by the act of acquiring it for his Parisian apartment, the painting merely presents the conflicts of nations, rather than resolving or transcending them. The central, mechanical 'elephant' evokes a military spectre, an alien juggernaut nonetheless rendered German/Wagnerian by its Teutonic horns. Its malevolent superstructure suggests a grimly engineered orchestra (a red piano, a harp, an organ pipe?) – conflated with the parallel symbols of a watchtower. The monstrosity of the 'elephant' lies in the mixed military metaphor: through the seemingly ribbed and collapsible nature of the creature's phallic member, by the fleshy eye/breasts at the end of the proboscis, and finally, by the small piece of clothing worn by the horrific probe.

In the alchemy of paint, the serrated white appendage near the lobed end of the phallic trunk is both skirt and/or collar, cloth and/or steel, stiffened lace and/or functional metallic gear. As 'skirt,' it plays the role of the French maid's apron taken from pornographic sources – the perky white cloth that barely covers (and hence signifies) the forbidden locus of desire and dread. As collar, it reverts to the golden age of Dutch portraiture, when dignitaries commissioned portraits adorned with costly white lacy handiwork. As metallic steel gear, it completes the conversion of this phallic woman into the ultimate military spectre – an armoured, hardened drill bit whose extending probe and blackness only hints at the fearfully obvious hole at her very core.

We have worked within the limitations of what can be observed within the painting's imagery and that which is suggested by its title (both configured as being 'on the surface') – scanning the way the canvas is painted, the placement of its imagery, the evocations of otherness in name and place – to find references to a particular configuration of the 'real' at the moment of its creation.

Scholars of Ernst and surrealism have gone farther, connecting the 'elephant' with the visual appearance of French gasmasks, in which a rubbery breathing tube moves down to a shiny chamber of steel for filtering air.[31] The beast may also be a reference to the biblical figure of Behemoth (illustrated in French tradition as an elephant): 'his bones are as tubes of brass; his limbs are like bars of iron' (Job 40.18). In contemporary accounts of Behemoth – specifically, one by French poet and critic Guillaume Apollinaire, whom Eluard knew – Behemoth is self-created: 'I am the dictator. Here the voice of Behemoth, without origin … unique, immobile, and … immortal'.[32] In this analysis, Ernst's Behemoth looks ahead to the rise of Hitler, back to the abuses of the Kaiser, but also sideways to the wartime chauvinism of Apollinaire himself.[33] Yet these internecine European conflicts are not the only ones depicted in *Celebes*. It is significant that this cross-gendered, self-created mechanical dictator should be so black that its ridiculed yet still-terrifying power should be thrown into relief by the beckoning of a decapitated white female, her ivory-skinned inducements reminiscent of many other works of European Orientalism (from Shakespeare's *Othello* to Delacroix's *Sardanapalus* and Ingres's odalisques).

The blackness of the beast reinforces the notion of the 'other', proclaimed by the painting's title. Scholars eventually discovered that Ernst's 'elephant' – besides making an allusion to a scurrilous bit of Germanic doggerel[34] – was modelled on an enormous, two-legged communal corn bin, built of clay by the Konkombwa people of southern Sudan. Ernst had found the image in an illustration for a British anthropological journal, surrounded by scientific reports on a colonial outpost. Many substitutions were effected in Ernst's conversion from photo to painting: evocations of metal to represent earth, steel for straw, shine for wattle, and black for pale clay. In the photograph, the earthen Konkombwa corn bin merges seamlessly with the dusty, pale ground, but in Ernst's painted rendition, the structure is darkened and thrown into sharp relief against a desolate ochre ground. The 'Africa' of clay corn bins was not enough; *black* Africa was needed. A smaller painting Ernst made just before *Celebes* may shed some light on the various readings.

*The Emperor of Wahaua (Der Kaiser von Wahaua)* was finished in 1920, and now hangs in the Folkwang Museum in Essen. This little-known painting has never been explicitly linked with *Celebes*, yet it clearly forms a symbolic template for the more famous painting. The emperor (recall Behemoth, 'dictator … without origin') is here a slight figure with African features and mahogany-coloured skin, swathed in an enormous black garment fitted with stiff, gleaming white cuffs and a starched white collar reminiscent of the skirt/collar of *Celebes*. A tall crown or turban sits on his head, and he holds a staff with a golden orb. A larger bluish ball is on the floor nearby. To the left of the figure teeters a tricoloured (red, white and blue) platform that stands miraculously on one side. On the table stands a strange assemblage of biomechanical parts in red and greyish-blue, culminating in a lidless blue eye (a more organic version of *Celebes's* 'watchtower'). Far beyond this structure, on the horizon, a distant snow-covered mountain can be seen. Just above the elaborate headdress worn by the emperor, seemingly emerging from some vent in the tabletop structure (or emanating from the emperor's head) is a bubble in which a smiling white female applies powder to her face. The

African emperor turns his back to all of this, fixing our gaze with a calm and unreadable stare.

This 'Emperor' is linked to the most famous of African kings, the holy wise man (magus) whose bones were supposedly preserved in the cathedral of Ernst's native Cologne. This 'savage' who saw the light of Christ and turned his royal steps toward worship brings the black bulk of *Celebes* into a full hermeneutic play of obscure meanings: nature and culture, animal and divine, sexualized despot and pious pilgrim, Orientalist 'other' and revered origin of the local cult of the national church. Max Ernst, reborn in a grim post-war Germany, taking his inspiration from various sources (de Chirico, medical journals, catalogues of prostheses, anthropology texts, poetry, dreams, religion, and dada collage), achieved the paradox of surrealism *avant la lettre*: an inner vision revealed to a public mind. Black Africa and Indonesia are appropriated, on the one hand, for the stock role of the 'other' in Western European painting, creating a location (at once specific and 'imaginary') to Ernst's vision of a desolate foreign nightmare populated by pale women and menacing military men. On the other hand, as for Picasso earlier in the century, the exotic and powerful other is also punishment and/or alternate identity for the nation/self – particularly that self that begins the process of making art by seeking a way out of the corrupted culture of modernity, through a pilgrimage to another place.

It is obvious from Ernst's own paintings, that in post-First World War Germany, an African king was representative not only of the wise men supposedly interred in Cologne's cathedral: he was also the inhabitant of the colonies coveted by England, France, Italy, and Portugal. Here we should recall that Germany's bid for a tenuous hold on East Africa was curtailed, once and for all, by the Treaty of Versailles. It is significant that the 1919 copy of *Der Ventilator* that Ernst handed out at the factory gates with his friend Baargeld printed the following stream-of-consciousness emission from a certain Macchab (the name of a Biblical spirit who occasionally appeared to one of Ernst's occultist friends in Cologne): 'Caution advised, sham corpse follows. Nubia's highways, likewise caravanserais in western and eastern Sudan, already polluted. Annual realization of Mecca questioned this year ... Repeated auto-castration of the Negus, incredible effects: thousands of Christian lip-servers from all parts of the Abyssinian Empire fanaticized'.[35]

The same uncomfortable connection of ruled (African) and ruler (Emperor) in the paintings, led one of the French dadaists at the opening of Ernst's second Parisian exhibition to conduct 'mock tours' of the installation 'dressed in blackface as the President of Liberia'.[36] The subaltern is summoned to terrify, to mock, to unsettle, to educate, to shame and even degrade those present. And in the process, the notion of nation is also criticized.

The essential truths of nation as *Heimat* will not hold up, and efforts to subdue the colonized as a way of articulating national essence will be threatened by the return of the repressed, the eruption of the 'native' into *Kultur*, the discovery of the German Kurtz at the heart of darkness (to refer to Conrad's influential novel). This return of the repressed 'other' could manifest itself in concrete political terms, or in a constantly troubled cultural imaginary – the latter being the field of inquiry chosen by the surrealists. The lasting power of surrealism resulted from this paradoxical position – a vantage point from which the artist could become an internal exile and a commentator on the relations between the psyche and the modernizing nations of a shrinking world.

## POLITICS AND ABSTRACTION

### *Guerre* and *Guernica*: paroxysms of nationalism

As we have seen in the case of an individual (Ernst) and the larger stylistic shift from dadaism to surrealism, mechano-morphic art and abstraction in general lost their appeal for European modernists after World War I. A kind of 'return to order' surfaced in France, Italy, Germany and England, and the US 'objectivity' replaced expressionism as a valued term: Germany's Neue Sachlichkeit painters produced sober, realistic images of urban life, Italian Strapaese ('super-country') artists praised the reflections of peasant life that appeared in Morandi's paintings of simple bottles and bowls (held to materialize the 'dust of Tuscany' revered by rural Fascists), and France – keeper of the flame for avant-gardes the world over – produced a form of reactionary modernism in artists of the Ecole Française, who sought to distance themselves from the productions of a 'pan-Semitic' school of Paris and the nascent surrealistic movement. Surrealists were attracted to this return to order (evidenced by Ernst's return to the representational images of an imaginary world), but were never as flagrant as right-wing artists who openly touted the supposedly stable truths of 'blood and soil' in their various national schools. These conservative realists were celebrated as the culmination of a move to preserve the glories of French painting for the native French, or Teutonic/Aryan painting for the 'true' Germans, Tuscan verities for the 'true' Italians, heartland 'Regionalism' for Americans, and so forth. Tragically, the self-policing required by these stringent forms of post-First World War nationalism turned into self-hatred for many; thus it was an assimilated German Jew writing in a Paris newspaper (Waldemar George) who articulated the 1930s nativist programme in its most virulent form: 'The moment has come for France to turn in upon herself and to find in her own soil the seeds of her salvation.' Such authors cited Chancellor Hitler's authority to articulate what had gone wrong with French art, and to explain how it had 'lost' its power to communicate to a wide public.[37]

In what scholars of this chilling confluence of nationalism and modern art call a 'parenthesis' in fascism's rise, the countervailing campaign for the Popular Front enabled Léon Blum, an Alsatian of Jewish descent, to be elected the head of the French Government (the Popular Front would also win elections for the Republicans in Spain). It was under Blum's leadership that the last of the great Paris world fairs was organized, just as the Nazi's Degenerate Art exhibition was travelling throughout Germany. As it turned out, the 1937 Exposition Internationale in Paris would be the final opportunity for the nations of the supposedly 'civilized' world to gather before the outbreak of the Second World War. Even at the time, the international fair's simulated universe was seen to stage the rising tensions of a 'war to end all wars' all over again. The setting for the 1937 Exposition Internationale was already studded with architectural remnants of previous extravaganzas, dating back to Napoleon, who had appropriated the area for his son's palace, converting the Champ de Mars from army

training ground to territory for ritual displays of power. The site chosen for the Exposition also included the Palais du Trocadero, built for an 1878 exposition (and the site of the 1907 encounter between Picasso and the 'dusty mannequins' of African ritual art); this structure was modernized and renamed the Palais de Chaillot for the 1937 extravaganza. Flanking the other end of the fairground terminus was the grandiose eighteenth-century Ecole Militaire complex. The centre was marked by the 1889 Exposition's Eiffel Tower, which had served to announce to the entire world France's new role as the capital of world modernism. Eiffel's engineering marvel immediately succeeded in affirming France's leadership of both civilization and modernism (and, as we have seen, it was an explicit stimulus for Tatlin's tower). By design, it had loomed in aggressive technological contrast with the temporary mud-and-stick villages built around its base by 'natives' brought in as part of the nineteenth-century Exposition Universelle.

By 1937, such blatant displays of colonial power relations were muted. Colonies' pavilions had been shunted to the side (quite literally, in an outlying section of the Exposition that referred not to 'empire' but to overseas France). The ruling socialists did not eliminate the colonial section, but simply miniaturized and marginalized it. The colonies were no longer the bustling engines of French economic prosperity (although certainly the closed markets of her colonies helped France delay the effects of a global depression). By 1937, they were merely tourist destinations. By contrast with the nineteenth-century's dramatic hierarchies, skyscraping steel looming over mud architectures, in 1937 one travelled to the overseas pavilions by crossing under the Eiffel Tower and moving laterally, through the 'Centre Régional' with its handicrafts from rural France, to a far-flung France. The visitor passed physically from the crown and centre of French civilization to France *péripherique*. In the other direction, visitors encountered displays of industrial products, while across the river they could view the culmination of technological modernity – modern art.

Many European pavilions were set up not along the edge of the river, but along an axis extending from the Trocadero down the esplanade; the remainder were accessed by crossing under the Eiffel Tower and proceeding southeast across the Champ de Mars toward the military academy. The most aggressive structures flanked the beginning of this axis, facing off across the Trocadero gardens (near the street now known as the Avenue des Nations Unies). In the most famous view of the fair (Plate 153), on one side loomed Albert Speer's neoclassical skyscraper, topped with the emblem of Nazi Germany (aiming to link nation with political party by means of an eagle perched on a giant swastika). On the other side was the USSR's pavilion: Boris Iofan's vaguely art deco progression of ascending masses of stone, culminating in Vera Mukhina's gleaming, stainless-steel sculpture of 'Worker and Collective Farm Woman,' two figures joining their hammer and sickle in a triumphant gesture. The obvious confrontation of the two buildings was planned by the French, who had determined the location of all national pavilions, but an aesthetic battle was waged by Speer, who had gotten his hands on the secret plan for the Soviet pavilion and was determined to surpass it. The architectural and ideological battle was dismissed by cubist painter André Lhote as a clash between 'pretentious stone dragons'; one commentator in *Architectural Record* noted tersely: 'It is this militant pair of pavilions that one sees at

every turn overshadowing the modest efforts of the more numerous democracies'.[38]

Months after the fair's inauguration, one of the democracies' 'modest efforts' opened, tucked into the shadow of the Nazi monolith and nearly invisible to the casual passer-by. The low-lying, inexpensive slab designed by Josep Lluís Sert for the struggling Spanish Republic was a glass-sheathed modernist structure; its open construction of pre-fabricated structural steel (left exposed and painted deep red or white) was fitted out with plywood, rough cement squares and straw matting. It seemed so blatantly anti-*luxe* that some visitors assumed it was unfinished. Guidebooks made no mention of the economic effects of the raging Spanish Civil War and did nothing to acknowledge that the 'nation' in question was a besieged faction of a country whose power had been seized by Nazi-backed Spanish fascists. The Spanish Republicans were socialists whose Popular Front had been democratically elected only one year earlier, but they were struggling to survive against a military uprising supported by soldiers, landowners, clergy, and residual monarchists in Spain, as well as Italian and German fascists abroad. Spain was divided and in dispute: Republicans remained strong only in the Mediterranean south and in the Basque region of the north. Even the ideology of 'nation' had been claimed by the fascist Nationalists (leaving the Republicans little option but to call themselves 'Loyalists' of the true Spain.) The silence of the fair's guidebooks reflected the period's uneasy political climate – for Léon Blum's socialist government had withdrawn French support for the Spanish socialists in the summer of 1936, thereby joining 25 other nations in signing a non-intervention pact. Official fair policy allowed the Spanish Republicans to sneak in with a pavilion, but very little real estate or promotion accompanied that gesture. Unofficially, however, leftist artists and intellectuals in France spearheaded a campaign to win worldwide support for the cause of Republican Spain. Even non-Spanish artists (such as the American sculptor Alexander Calder) came to adorn its empty pavilion, and other avant-garde modernists attempted to make it the best-known icon of the fair.

Spanish artists who had long been working in France were the first to rally to Sert's call for participation in setting up the Spanish pavilion – to make a heroically modern Spain speak before the world. More than any other object of the hundreds at the fair – regional crafts, technological inventions, oil paintings, photomurals, monumental sculptures, and imposing architecture – the commission of Picasso's *Guernica* came to be the emblem of the moment (Plate 154). *Guernica* possessed the further trump card of surviving the fair, and so could assert itself throughout the remainder of the twentieth century, playing an active role in geopolitics even as it retreated into a documented past. Beyond its inherent artistic properties, *Guernica*'s immediate and continuing fame resulted from the confluence of three circumstances: it was the largest painting to date by the world's most famous modern artist, it addressed the world's first act of aerial civilian firebombing, and it reflected a groundswell of leftist outrage at the European abandonment of the Spanish Republic. While the painting's initial fame was secured by its profoundly political context, the painting's semi-abstract form and generalized themes ensured that the masterpiece transcended the historical circumstances of its production in early June of 1937 to become an icon of 'man's inhumanity to man.' Depoliticized to a certain extent by its

own creator, *Guernica* eventually transcended the strictly Spanish context to represent opposition to state violence of any kind.

The fact that *Guernica* lends itself to diverse interpretations is an essential aspect of the painting and its modernism. The painting's message has always been unstable, oscillating productively between a frankly propagandistic outcry against the bombing of a Basque village by foreign fascists, and a complex and ambiguous work of art that employs personal imagery dating back decades in Picasso's career (and centuries in the traditions he employed). What remains extraordinary for the purposes of this chapter is that more than any other work of twentieth-century art, *Guernica* embodies the conflict between international modernism that, by its very nature, must be 'above politics,' and a nationalist context that determines meaning for the work of art in profoundly local ways. That 'nationalist' context for *Guernica* was displaced, but doubly emphasized – firstly, by Picasso's status as an expatriate and his corresponding eagerness to demonstrate loyalty to an 'essential' Spain, and secondly by the eponymous 'nationalism' of Franco's Falangists, whom Picasso and the Republicans opposed. To further complicate matters, the 'essential' Spanishness of Picasso's imagery was constructed in the lingua franca of international modernism, even as it was self-consciously posed against an international encounter of fascists in three countries. Finally, given the painting's nearly total absence of signs that convey a specific twentieth-century time frame, Picasso's commitment to modernism remains coded rather than explicit, conveyed in style and form rather than content.

Given these complexities, it could be argued that *Guernica* merely redraws the lines of nationalism, seeking to contest Franco's artificial 'Nationalism' (which was, after all, deeply linked to 'foreign' fascist powers) by contrasting it with an 'essential' Spain – expressed in references to the bullfight, or the agrarian classicism of horses, oil lamps, and tiled roofs. But it can also be argued that in choosing Picasso for their principal commission, Republican Spain sought an international cosmopolitanism rather than a confirming nationalist essence. The architect Sert, who was instrumental in commissioning Picasso, intended Spain to be seen as explicitly modern against the reactionary forces of Franco's monarcho-fascist block. Whether Sert was satisfied by the result is another matter. Like the work by other nomads we have examined, Picasso's painting exemplified the curious hybrid blend that gives modernism its poignant appeal and conveys its persistent dream of internationalism. Part 'primitive' (seeking alternatives to modernity in Africa and elsewhere) and part 'advanced' (following theories of space-time elaborated by scientists and philosophers deeply affected by the regimentation and technological innovations of modern life), part 'national' (like Tatlin, Carrá and Ernst, marked by a specific linguistic and political past) but also desperately seeking release from provincial origins (in the 'internationale' of communism, the Surrealist International, or 'international style modernism' as a whole), Picasso was a complex figure. *Guernica* revealed the fruits of his complexity and hybrid nature, and the coming-of-age of modernist painting. This historic mural marked a period in which the formal and intentional ambiguities of an image could be seen as fundamentally productive, and in which ambiguity and abstraction (in a 'public' political painting) underscores the crucial role of the *viewer*, who becomes the public subject of an essentially private modern style.

The architects of the Spanish pavilion came to Picasso as pilgrims in January 1937, appealing to him in his new capacity as director-designate of the Prado museum to accept their mural commission. He showed them a series of etchings he had begun after fascists attacked his hometown of Málaga, titled *Dream and Lie of Franco* (*Sueño y Mentira de Franco*) and read his poem on the same theme. They looked at the etchings and saw the bulls and horses that would emerge in *Guernica*, but these farm animals were merely victims of an evil agent (Franco) who dominated almost every frame (but would completely disappear from the painting). Picasso's surrealist, stream-of-consciousness poem reinforced this conflict between the nakedly phallic Franco: 'fandango … of swords of evil-omened polyps … his mouth full of chinch bug jelly of his words' and the innocent mass: 'cries of children, cries of women, cries of birds, cries of flowers, cries of timbers and of stones cries of bricks, cries of furniture'. Picasso read his poem 'with such extraordinary enthusiasm and force and violence' that the commissioners and architects knew he would accept, and they cherished hopes he would produce a rousing and dramatic spectacle for their space. They even managed to collect the money to pay him, rendering the final mural-sized canvas the property of the Spanish Republic; yet it was the painter who controlled the destiny of *Guernica* – even after the artist's death, when Franco struggled to claim the painting as proof of a 'unified' Spain.

Clearly Franco would not have made such efforts if Picasso had incorporated imagery of *Dream and Lie of Franco* into *Guernica*. How and why did the figure of Franco disappear from *Guernica*? To a certain extent, the absence of Franco reflects the skill with which the fascist leader cunningly avoided being implicated in the bombing of Guernica itself. However, Picasso might have also decided to omit any direct representation of Franco based on the demands of international modernism. When Picasso began *Dream and Lie of Franco*, the junta leader was a petty isolated and somewhat ludicrous figure. Like Hitler before the putsch, Franco in January could be mocked as a goofy, polyp-headed pretender, a foolish Don Quixote with his pathetic little crowns, his archaic swords, his medieval banners (held aloft in one frame by a tumescent phallus) and his ineffective steeds (horses that are gutted, exhausted, mangled, or in one case transformed into an immobile pig). But this fool could not play the role of monumental, transcendent, impersonal evil that inspired *Guernica*. In fact, the Franco imagery lost steam even before *Dream and Lie* was completed. At the time of the commissioners' visit in January, the final four plates of the etching remained unfinished. Through April Picasso made other works, read newspapers, talked to friends, and retreated. Seemingly immobilized by the weight of his commission, Picasso left only a few surviving sketches from those first months – they show plans for a large mural on the theme of the artist in his studio, hardly the stuff of modern history painting.

Then there was the galvanizing event – the bombing of the Basque village of Guernica by Nazi and Italian squadrons on 26 April 1937. With this collusion of high-technology foes (a show of Axis power for the benefit of France as well as Republican Spain), Franco's evil was both magnified and diffused, beyond the control of a single despot. As newspaper reports trickled in on the 28 and 29 April, public outrage

increased along with information, and disinformation. Picasso drew his first study on May Day, and the painting *Guernica* was completed in a furious burst of activity over the next five weeks.

The poetry and narratives that accompanied Picasso's painting once it was installed at the Spanish pavilion contributed to the 'public relations problem' that the fascists began to experience as a result of their tactical bombing of civilians that sunny market day. Apparently unaware of Guernica's symbolic importance as centre of ancient Basque traditions of democracy and self-rule, the Germans of the Condor Legion (with the help of one Italian plane) flew their Junkers in a series of sweeps that began with low drops of heavy bombs and hand grenades, followed by a second low pass for blasting escaping civilians, and ended with a number of high fly-overs for dropping incendiary bombs. Despite the fact that no military installations were destroyed (the railroad station and town bridge had been immediately obscured by the dust from the first wave of bombs; the small arms factory outside town was left untouched), Freiherr von Richthofen recorded in his diary that the raid had been a 'complete technical success'; Hermann Goering later testified at Nuremberg that the German leadership was pleased, since they had wanted primarily to test 'experimental fighter units, bombers, and anti-aircraft guns... under combat conditions'.[39] A Basque priest who survived the attack by seeking shelter under trees recalled that 'Even then I realized the terrible purpose [of the fire bombing.] They were dropping incendiary bombs to try to convince the world that the Basques had fired their own city'.[40] The witness came to this chilling realization when German squadrons came back into the smoking ruins to pick up any pieces of aircraft and unexploded bombs that might link them to the attack. Franco in turn began to disseminate the Nationalist version of events: the Basques had set fire to their own ancient capital to drum up support for their cause, destroying their own town hall with its age-old documents and archives, gutting the seat of free democracy long symbolized by their ancient oak, where royalty had stood for centuries to seek allegiance as 'señors,' not kings, of Vizcaya.

Picasso read the other side of the story in the French communist newspaper, *L'Humanité*. Typical of the paper's sarcastic tone was this caption below a photograph of corpses in the charred town: 'Nothing left to chance in the Fascists' atrocious extermination of the non-combatant population.... Above, some women – mothers no doubt – slaughtered during the bombardment'.[41] The progression from *Dream and Lie* to *Guernica* suggests the complexity of Picasso's evolving moral judgments about the war; from the early emphasis on a grotesque leader, the artist shifts to a more general narrative that appears to be entirely about victims. The earlier depiction of Franco disappeared, but the horse and bull also underwent subtle transformations.

In the ancient Mithraic cult of the bullfight engrained in the national imagination in Spain, horse serves man, and both can share the same fate if the bull turns. But the bull, too, can be cast as a victim – the animal is sacrificial totem of man's bestiality, as well as symbol of eternal life-force (there is always another bull to come into the ring). In *Dream and Lie of Franco*, these roles are fairly stable – the bull in every case is an avenging 'spirit of Spain,' confronting the hairy Franco and an equally polyp-headed horse in the two of the last images of the series of etchings (drawn in January before bombing, or painting, had begun). The horse

is both servant of Franco and humankind, bearing up under Franco's pretensions in the series' first frame, nurturing a bearded poet in another, winged victim of Franco, and, finally, conflated with Franco himself in the last frame to be drawn.

In *Guernica* these details are lost. The figures of horse and bull play crucial roles, yet exactly what they signify remains unclear. The horse occupies the painting's central commanding pyramid, together with the figure of the woman reaching with her lamp (sometimes interpreted as 'Truth,' she is the only compositional element to remain perfectly intact from Picasso's first sketch). Intriguingly, the hair of the revolting Franco-polyp from the series of etchings has now been distributed across the surface of the painted horse's skin, as if to perpetuate the horse-as-Franco that Picasso etched in *Dream and Lie*. But the horse is also depicted as universal victim. Sliced open with a gash that extends beyond its body (appearing near the centre of the painting, it dominates the composition and reads as a slash in the canvas itself), the horse is also pierced by a spear that enters behind its neck and grotesquely extrudes through its sagging belly, echoed metaphorically by the animal's screaming, dagger-like tongue. The fear in the horse's tiny-circled eyes is echoed in the bird that squawks on a table behind it (a kitchen table? a market stand? or a sacrificial altar?) The young woman stumbling toward it bears similarly dumbfounded eyes. Her legs are heavy and leaden in paralysis, her shawl and scarf are flapping open, and her bottom is bare as if roused from the outhouse, evoking, 'the commonest and most primitive effect of fear' in the words of Picasso.[42]

Framing the central pyramid and reinforcing the sense of a triptych in the overall composition are two more women. The one on the right falls from a burning building, her back cut by flames; on the left, a mother grieves her dead child in a modern version of the pietà. Stretching across the canvas foreground are the dismembered parts of a warrior: one muscular right arm (with a hand modelled on Picasso's own), a head as bald and frozen as a classical statue's, and another right arm clutching the remains of a shattered spear, which sprouts a ghostly flower from its hilt. Above the monochrome, nightmarish tableau is a single twentieth-century detail – a light bulb – added in the final stages of painting as if in mockery of the omniscient eye of God.

Unlike *Dream and Lie of Franco*, Guernica makes little reference to actual governments, or modern warfare (beyond its title). In the various phases of execution, captured by photographer Dora Maar, we can observe Picasso's systematic elimination of explicit national and political symbols. The light bulb replaced the warrior's upraised fist, bearing a handful of grain silhouetted against the solar disk – the anarchist party salute. Red tears previously dotted the women's faces, possibly a reference to the colour of the republic (red) as opposed to the Fascist 'white'. The victims that previously littered the floor were eliminated, and only an outline remains for each remaining figure (except horse and fallen warrior, whose limbs tangle and intertwine). The sole survivor of this systematic deletion is an arrow, symbol of Franco's Falangist party, inserted between the horse's hind legs, as if to preserve some faint reference to the specifics of the conflict. But it is merely an outline, a ghostly fragment almost lost in the scuffle.

The bull is essential to Picasso's non-declarative statement and to the ambiguities of *Guernica's* actors. As art historian

William Rubin has noted, *Guernica* represents at least three major themes in Picasso's life and art: the Crucifixion, the national ritual of the bullfight, and the mythological tradition of the Minotaur.[43] The *Guernica* bull connects with the last two themes, but although it has always been linked to the Minotaur myth (particularly by analogy with Picasso's similarly composed etching, *Minotauromachy*, from 1935), the *Guernica* bull's lidded, almond eyes reveal that Picasso evokes here the man-headed bull (rather than the bestial Minotaur).[44] The Minotaur was Picasso's emblem of his own satyr-like sexuality, but the man-headed bull refers to a different mythological theme – Zeus's incarnation as a white bull in the mythological founding of Europe. The Europa myth is no less sexual, but it is also divine – and its grand historical sweep is more appropriate to the scale of this painting. The white-headed, almond-eyed bull could well be an impregnating Picasso – but it is Picasso as bearer of a European future. He is present at Guernica but untouched, forced to acknowledge his god-like detachment from this scene of senseless murder, illuminated only by a news-photographer's flashbulb and the guttering flames of war.

Beyond his own literal removal from the conflict, Picasso's distance was rhetorical, as we have seen. He was wary of organized politics in general (his famous post-war commitment to the Communist party notwithstanding). But the apolitical tenor of *Guernica* may have been endemic to a nation struggling with civil war, where 'nation' is an ideology that manifestly fails to alleviate the rage and hatred between neighbours. At the dedication of *Guernica*, one speaker cited the comment of the Republic's President, Manuel Azaña, who had referred to 'a terrible people, the Spanish people, terrible principally to themselves because it is the one people of Europe capable of pricking itself with its own sting'.[45] Picasso seems to have felt that it was too simple merely to condemn Franco or rant at fascists. At the core of Spanish identity, as he constructed it, was the cultural negotiation with violence, reflected in the fact (often remarked upon by Picasso) that the national spectacle of the bullfight was always scheduled immediately after Catholic mass. Ruminating on the subject later, during the intense Allied bombing of Europe in April 1944, Picasso saw both sides as animated by bloodlust. But even then he accorded a special status to the Spanish: 'The Spaniards are alone in their love of violence and cruelty – they love to see it flow, to run: the blood of the horses, the blood of the bulls, the blood of men. Whether they are 'whites' or 'reds', whether priests or communists are tortured and burned there is always the same pleasure in seeing the flow of blood. In that particular realm, no one can top the Spaniards'.[46] *Guernica's* bull was thus extremely complex: Picasso and Zeus, unfeeling animal and god-like witness, distant European and tragic Spanish soul, Mithraic sacrifice and symbol of eternal life, peasant nobility and fascist darkness – even the astrological symbol (Taurus, Hitler's sign). By 1947, pressed to explicitly link the bull to the bestial regression of fascism, Picasso protested: 'But this bull is a bull and this horse is a horse. There's a sort of bird, too, a chicken or a pigeon, I don't remember now exactly what it is, on a table. And this chicken is a chicken. Sure, they're symbols. But it isn't up to the painter to create symbols; otherwise, it would be better if he wrote them out in so many words instead of painting them. The public that looks at the picture must see in the horse and the bull symbols

which it interprets as it understands them. … *It's up to the public to see what it wants to see*'.[47] Picasso's insistence on making the reader determine the painting's meaning was characteristic of his modernism and a crucial component of *Guernica's* fame. It was a complex strategy whose success was compromised on artistic and geopolitical fronts.

Left-wing writers either sought to fix its meaning (referring to the painting as *The Massacre of Guernica*) or denounced its weird abstractions as 'wholly inadequate for the wholesome mentality of the proletariat'. In one of the few reviews in the mainstream press, the architect Le Corbusier stated '[*Guernica*] saw only the backs of the visitors, for they were repelled by it.' The German guidebook to the Exposition internationale described an unnamed painting in the 'Red' pavilion of Spain that seemed 'to represent the dream of a madman, a hodgepodge of parts of bodies that a four-year-old child could have painted'.[48] There was some discussion of removing the canvas and replacing it with a comprehensible social realist work – after all, in the nearby French pavilion, fellow cubist Fernand Léger had sought clarity in his cheerful tribute to the *Transmission of Energy*, by combining photographs in a utopian montage that brought city and country together under the raised fist and rainbow of the Popular Front. The antagonism against the painting by both left and right galvanized a group of artists and writers to come to *Guernica's* defence. They found support from Greek expatriate Christian Zervos and his wife Yvonne, who commandeered a double issue of the international contemporary art journal, *Cahiers d'Art* (edited by M. Zervos), and devoted it to Picasso's painting and to the Republican cause during that summer of 1937. The stakes were very high, and *Guernica* became the new face of an international modernist agenda.

When the Spanish pavilion was dismantled in November, the Republic that had commissioned it was in desperate straits. *Guernica* had stayed with Picasso in Paris, and the collapse of the Republican government in March 1939 rendered him the custodian of a painting he did not legally own. Even before the cause was lost, however, Picasso had shown no compunction to ask anyone in the Republican government what he should do with the painting; as honorary director of the Prado, he was in some sense acting as a government official when he agreed to send the enormous canvas on a world tour. Throughout the war, *Guernica* was a primary fund-raiser for Spanish war relief. Not incidentally, it also proved its mettle as a proselytizing force for international modernism and abstraction in public art.

The strangest chapter in *Guernica's* very public life was the aged Franco's decision to launch a campaign to obtain the painting's 'return' (even though it had always been abroad) to a Spain that it had always avoided. So convincing was Picasso's Spanish identity (despite the fact that the majority of his life and artistic career was spent in France), and so malleable was the aesthetic distance that Picasso had constructed around the Guernica event and painting itself, that by the late 1960s Franco declared that the painting and its maker were national treasures of Spain. The move for *Guernica's* 'return' also gathered force from international modernists in Spain who sought to build bridges to counteract their isolation within the world. But the campaign for the painting's 'return' was no conversion on Franco's part to the beauties of surrealist modernism; it merely represented the slow momentum of a national state

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seeking to maximize its cultural capital. Not coincidentally, it was also part of a plan to neutralize the poisons of the past – a past that Spanish art historians under fascism had already laboured to erase, by claiming that Picasso's painting was 'no longer an illustration of one specific bombardment, but the picture of all bombed cities'.[49] The monumental complexities attending the transfer of *Guernica* to Spain after Picasso's death were slowly resolved after the 'Caudillo,' Franco himself, died a few years later. In 1981, Picasso's lawyer, Roland Dumas, finally agreed that the Spanish Government, though not a republic but a constitutional monarchy, was sufficiently stable to satisfy the conditions Picasso himself had established: that the painting should go to the Prado when civil liberties had been returned to the Spanish people. Even ensconced behind thick plate glass and protected around the clock by an armed guard (defending it from capture by Basque nationalists), the painting's first installation in Madrid signified powerfully that, as the newspaper *El Pais* announced in banner headlines, 'THE WAR HAS ENDED.' The painting's perceived internationalism was balm for the reconciliation and healing of past wounds at *Guernica*'s opening in Madrid, as communist orator 'La Passionata' (Dolores Ibarruri) rubbed shoulders with the Duchess of Alba. But when the Minister of Culture announced: 'Nobody should interpret the work as a flag for any sector – let us look at *Guernica* as a pure and simple rejection of brutal force',[50] that choice of phrasing ('should') revealed that people still needed to be told what to think about it. *Guernica*'s ambiguities remain neither pure nor simple; they alone will prevail.

### Trauma and transcendence

The figured gash in the *Guernica* horse's body (and, by implication, in the canvas) was only the beginning of a process that developed after the end of the Second World War. As part of a larger social body, art was wounded, in some deep metaphorical sense. Fragmented bodies, slashed canvases, and sculptures that looked like excrement or rubble – all enacted trauma in both Europe and Japan. Heroic figurative painting had been urged by social realists on the left and fascists on the right, and thus modernist abstraction was the perceived antidote; still, it needed to evolve to a point where it could be felt as 'expressive' of the post-war condition. Curious hybrids emerged in this evolutionary process, and the body (as art, or in art's production) had a major role to play.

Giuseppe Panza, an Italian art collector who began to purchase works in Paris in the mid-1950s, later commented that 'in some way the Second World War was the end of Europe', and he addressed the pervasive feeling of crisis in the post-war years:

> I felt very deeply the changes taking place after the war. The rationalist vision of life and the idealist philosophy of culture had been popular in Italy. But [the war] was deeply shocking to the belief in man's rational capacities... To see how reason failed totally during the war was a great crisis for European culture.[51]

The First World War had perhaps left a striving for geometric, technocratic modernism intact (recall that the 'International Style' in architecture was born from the rubble of that war, and was celebrated at New York's Museum of Modern Art in the depths of the Great Depression), but the second global conflict had seriously damaged that faith. There were strong victories by the left in the political sphere, but in the arts, production seemed to tap into a deeper mood of despair and anti-rationalism. Colonialist primitivism finally waned, but in its place Northern Europeans sought works by children, art of the insane, and other absolute alternatives to civilization and 'fine art'. Similarly, young Spanish and Italian painters sought one type of 'ground zero' in matter itself (a trend that would also emerge forcefully in Japan). This engagement with inarticulate base material (dirt, sand, mud) was coupled with 'wounds' and signs of trauma in the body of the painting itself: torn canvases, slits in the paint membrane, and surfaces glutted with grit. Both figurative and abstract productions spoke to the general state of abjection – paintings were traumatized objects in need of either burial or repair.

Some of the artists who gained prominence in this period were young non-combatants, growing up into what seemed to be a blasted theatre of rubble and defeat. Others had been painting in an anti-rational vein for decades, but discovered that the world suddenly agreed with their pessimistic views. A self-referential morbidity dominated Continental philosophy, crystallizing as Existentialism, which predominated in Paris and New York in the 1950s. Japanese artists sought alternatives to the state religion of Shinto (corrupted into a nationalist emperor cult during the war), in part through an evolving Zen Buddhism that negotiated with the aggressive individualism of the culture of the occupying Americans. The nearly global aesthetic tendency toward agonistic expression, crusty surfaces, and anti-fine art was packaged neatly in 1952 as 'le mouvement informel' in Michel Tapié's book *Un art autre*; in place of cubism and geometric order would be formlessness.

The work of Jean Fautrier, a minor figurative painter all but forgotten in the wake of abstraction's dominance after the 1950s, helps illuminate the complexities of modernism as it appeared in Paris immediately after the war. Fautrier's best-known works date from the mid-1940s, when the artist's dark vision of human depravity caught up with the public humiliation of Vichy (pro-German) France. Produced in relative isolation, Fautrier's wartime paintings were not exhibited until after V-day in 1945, when they served as templates for public renditions of France's role as victim in fascism's sweep.

Flayed beef, hanging rabbit skins, and a dreaming corpse whose intestines lie open to our fascinated gaze – these were the morbid subjects that occupied Fautrier in the late 1920s. The long Northern traditions of *vanitas* and *memento mori*, which had motivated artists since Rembrandt to capture such raw food-chain realities, mingled in Fautrier's works with surrealism and the nocturnal vision of symbolists such as Odilon Redon. Paradoxically, Fautrier's palette lightened during the war, as he began the series that would be retrospectively titled 'Hostages' (*Otages*). These heavily impastoed paintings began in 1942 with renditions of barely human heads surrounded by monochromatic deposits of plaster and pigmented mineral dust. The 'hostages' in question were understood by Fautrier's post-liberation audience to be those French Resistance fighters (and helpless bystanders) taken by German soldiers (most notably in the village of Oradour-sur-Glane, where Nazi

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troops killed more than 600 villagers on 10 June 1944). Some of the imagery Fautrier used thus precedes the politicized identity assigned to the paintings (as in Picasso's *Guernica*). As we have seen, the 'reading in' of post-hoc political subtexts was authorized by modernism's increasing demand that meaning be based *within the viewer*. It is as if the identity of these subjects as 'hostages' was called up when Parisian viewers found such imagery and associations to be historically necessary – and not a minute before.

The horrifying seductiveness of Fautrier's abject bodies and heads comes at us slowly and in waves established in part by the inevitable oscillation between word (in the title) and image (floating in the mind's eye, yet also materially grounded). The sex and breasts of a semi-abstract nude he painted in 1943, for example, appear as shimmering veils of russet, rose, and lilac oxides dusted over crusty mounds of white (highly reflective) plaster. But then the monosyllabic *Nu* of the work's title comes back into focus, and we struggle to read a nude body in the forms – our search connecting these tinted calciferous undulations to the grand French tradition of lounging odalisques (Boucher, Fragonard, Ingres, or Fautrier's closest master Matisse). But the body in question emerges as a horrifically amputated torso. Connecting with Fautrier's openly fetishistic works from the 1920s, his nude in 1943 is little more than breasts, belly and sex, without even the vestigial stumps that code for 'classical Venus' in the lexicon of aesthetic violence against the female form. The abjection of this body, its fragmentation, disorder, and stubbornly crude *bassesse*, recalled what theorists such as Georges Bataille (Fautrier's contemporary and one of his collaborators) had used to exemplify formlessness – that refusal to cohere into *belle peinture* (bourgeois preference and great French academic tradition). Bataille saw *bassesse* and the formlessness in social and psychological terms, 'affirming that the universe resembles nothing and is only *formless* … something like a spider or spit'.[52] Rather than merely a pretext for ordered composition (as André Breton would have it), formlessness was a radical challenge to Cartesian rationalism and humanist subjectivity (in place of the classically educated 'cogito' Bataille placed the mute animal 'excreto'). Fautrier flirted with these associations, but of course he did make Art: small cabinet pictures that were framed and sold. As Europeans came to know these paintings, whether grouped as *Otages*, or displayed with works such as the contemporaneous *Dépouille* (whose title translates as 'remains,' as in a corpse), their undeniable duality (between roseate veil of pigment and crusty, excremental base) was seen as expressing the unspeakable – and the war had brought home such a dialectic.

Are the famed 'Otages' any different? Perhaps they are not so cruel, because the sensuality of their surfaces is neither advertised (as in *Nu*) nor sustained. It is immediately cancelled by the violence of the mark – the gashes and incisions performed on that most expressive of all images: the human face. The mutilated faces of these heads immediately invoke monsters: Cyclops, in whom the eyes (seat of the soul) are fused in monstrous singularity (*Head of a Hostage, No. 1*, 1944), or apocalyptic lambs, where eyes multiply into visionary hordes (*Head of a Hostage, No. 14*, 1944). Viewing these heads as anonymous portraits (portraits of individuals made anonymous through violence), we are prepared to apprehend them in a heroic narrative of resistance, death, and immortality through art. But such

heroism does not come forth. If these are portraits, they are stripped to the bone of Being. No Renaissance hats, walking sticks, or views of distant vineyards – we view only disembodied heads, their eyes fixed open in perpetuity or scratched into blindness. These are paintings that require us to observe an individual whose social markers have been peeled away (and thereby subsumed into the rafts of 'displaced persons' massing in post-war Paris at the time they were exhibited). Fautrier's endlessly repeated hostage heads are unsettling in their intimacy, like the nudes – but their ethical address is radically different. Some would argue that their reiteration merely renders banal Nazi murder; others believe that the heads evoke the technological horror of those manufactured deaths.

Fautrier wanted people to believe he painted as a witness, an outsider to the 'other's' trauma; clearly the work of Jean Dubuffet and Wols (expatriate German Wolfgang Schultz, arguably the least known but most important of the *informel* group) could be seen in similar terms. Still other, younger artists seemed to have experienced the rupture of Europe on a more visceral level and worked with the canvas as an abject body, or with sculpture as metaphorical excrement, unworthy of 'art'. Immediately after the war (and before his better-known *Concetto Spaziale* slit canvases of the 1960s), Lucio Fontana produced lumpy, vaguely cubic accretions of gnarled, somewhat repulsive iridescent black ceramic (such as a 1949 work titled *Ceramica spaziale*). Around the same period, fellow Italian Alberto Burri exhibited torn shreds of rags, tenderly stitched together but always failing to cover the painting's ruptured surface, revealing red or brown areas as 'leaching through' the gaps between shrouds. Piero Manzoni was the third member of this Italian group who had briefly banded together to form an artistic collective; he perfectly expressed the shift from this late-1940s aesthetics of abjection to the 1960s discourse of commodity culture, in his infamous mass-produced tins of *Merda d'Artista* (Artist's Shit) in 1961. Confirming this Southern European emphasis on base materialism, Spaniard Antoni Tàpies produced 'matter' paintings built up horizontally on the floor, out of layers of cement, oil, marble dust, latex, sand, gravel, hair, and/or pigment (which is traditionally, after all, only another form of pulverized earth). These dense *tabla* were then scored, scratched, gouged and scoured like the vertical 'walls' with which they were associated as soon as they were hung, vertically, on the gallery or museum wall.

Begun shortly after he returned from a visit to post-war Paris, Tàpies's 'wall' paintings were his central revelation of the 1950s, fulfilling what he came to believe was his destiny and identity ('Tàpies' being Catalan for 'wall'): 'Each canvas [had been] a battlefield on which the wounds were to multiply over and over again, to infinity. And then came the surprise. All that frenetic movement, all that gesticulation [suddenly] came together in a uniform mass. What had been burning ebullition transformed itself on its own into static silence'.[53] Frenetic wounds into silence – this is something like the planned trajectory of *Guernica* (although silence has yet to be completely achieved); it is also analogous to the quiet toil of healing, as platelets and skin cells work to repair the body's integument, torn by violence and war.

Tàpies's approach to nationalism and internationalism was even more complex than Picasso's. He was living under Franco, and whatever patronage was available to him in Spain conformed to the constricted circumstances of that regime. Yet he succeeded in being highly mobile, arranging

exhibitions around the world to produce international contexts in which to show his art. Navigating the space between his isolated country's dour politics and an international modernism that would transcend regionalism, for Tàpies abstraction was a logical choice – it ensured that he would seem 'safe' to export. The 'battlefield' could be neutralized, as Tàpies said – yet its silent politics could be played out in a ghostly version, through a discourse of international modernism and avant-gardism that swirled vaguely around these abstract forms. As Picasso had demonstrated, international fame could give leverage, something even a fascist despot might want – but acquiring that fame required the most delicate rhetorical and artistic skills. Typical of the necessary manoeuvring is the following review, which opens with a grand tribute to Tàpies as master of the 'school of Altamira' (prehistoric, not modern Spain) and quotes the painter's incantatory prose:

> For them, as they stated in their manifesto, the Magdalenian cave of art of the northwest of their country was a symbol 'of living art, of art outside historical time, of art above all nationalism, representative of painting which fused forms and experience and revealed a great capacity for synthesis'.[54]

We can imagine why it would be crucial for an artist working in Franco's Spain of the 1950s to achieve an 'art above all nationalism,' anchored in a chthonic art of the cave dwellers. As with *Guernica*, abstraction and generalization could be a way of avoiding the traps of specific ideologies and local politics. Not surprisingly, we find Tàpies articulating ideas very similar to Picasso's in positing a transfer of meaning to the viewer – a viewer both *outside the canvas* and, increasingly, *outside the country*. The modernist canvas was necessary, but not sufficient cause: 'The painting is simply a "support" that invites the viewer to participate ... So, the "theme" can be found in the painting, or it can reside solely in the mind of the spectator'.[55]

For Northern Europeans, the path was similar, but the results were very different. The relay from meaning-located-in-the-image to meaning-in-the-viewer was a principle for Fautrier, as we have seen – but the reading of a 1942 Hostage painting in terms of a 1944 event at Oradour did not necessitate the level of abstraction that Tàpies seemed to require. Nor was such thorough abstraction needed by the German painter Georg Kern, who experienced a new interest in the truncated heritage of German (figurative) Expressionism in 1958 as a result of seeing American Abstract Expressionist works then touring in 'The New American Painting' exhibition. Inspired by the surging, yet totally non-representational brushstrokes of the paintings from New York, the young Kern changed his name to Baselitz (anchoring himself back to his birthplace or 'chthonic land') and sought his 'roots' in a restored German past. German Expressionism had always been insistently representational (the non-objective painting of Kandinsky was sometimes included into the movement, but inappropriately so) – Baselitz's neo-Expressionism thus surfaced in paintings of the human figure, but like Fautrier's they were abject bodies wholly vulnerable and full of wounds (see Baselitz's dishevelled, pathetic, half-naked Partisans from the mid-1960s). Other Northern Europeans seemed similarly committed to this figurative vein. Even the radical ambitions of the Cobra group (named for the painters'

home towns of Copenhagen, Brussels, and Amsterdam), in their raging manifesto written in a Paris café in November 1948, made their ideas materialize in figurative paintings that ended up looking a great deal like the highly textured graffiti figures of Jean Dubuffet's *l'art brut*.

Dubuffet's flattened 1950s *corps de dame* paintings, together with an American speaking tour on what he called his 'Anti-Cultural Positions' secured his reputation as a primary spokesman for abject, 'low,' unrefined art that could never be placed in the service of nationalism, because it was considered outside the radar of civilization. But even this fiery radical still operated in traditional figurative genres: the nude, the portrait, the still life, and the landscape. And curiously, the abstract/figurative split seemed to organize a post-war European aesthetical and geographical split. Thus, an invisible border can be mapped between figurative *informe* painters such as Dubuffet, Fautrier, Wols, and the Cobra painters of the North, and the more abstract tendencies found in Southern European artists such as Tàpies, Fontana, and Burri. An overarching analysis that views these tendencies within the context of a former theatre of war suggests that this may be more of a gap than a true divide. The canvas may be an abstract form that stands for an abject body (sutured in Burri, wounded but rendered 'silent' in Tàpies) or it may be a compulsive representation of an 'other' who must be simultaneously brought closer and held at bay (flayed in Dubuffet, made anonymous in Fautrier). In either case, the agenda is shared, although the means are divergent. Trauma needed, above all, to be recorded in the pictorial body.

As we have seen, most of these Europeans viewed trauma from the tips of their brushes, keeping formlessness at a discreet distance and making works that could still be framed and hung on a wall (or boxed under a showcase and mounted on a pedestal).

Asians had a profoundly different, much more visceral response to the war's aftermath, particularly in the formerly imperial Axis power, Japan. Japanese reflections on the tumult and trauma of war culture was led by calligraphers as early as 1951 (which was appropriate given calligraphy's position at the pinnacle of Asian artistic and literary culture). Just as Ernst had cast his post-war lot with Parisian surrealism, Japanese calligraphers turned to dissidents in the victor's culture for legitimacy. Consequently, calligraphers eagerly published images of Franz Kline's black-and-white abstractions in their new, avant-garde journal, and advocated a new international modernism that would synthesize East and West (and, one presumes, neutralize the poisonous nationalisms that had so recently divided them). An even more adventurous mixture of experimental approaches to art emerged in an obscure outpost of Japan's post-war art world, around a group known as the 'Gutai' (or 'Concrete') art association that formed around Yoshihara Jiro, an art teacher near Osaka. This *sensei* had moved through surrealism in the 1930s, so there was evidence that he was well tuned to the currents of international (e.g. Western, at this point) modernism. Immediately after the war he painted childlike, figurative canvases that could be compared to Dubuffet. His students coming to form the Gutai group were much more aggressive. They came to *inhabit* abjection, through their own bodily practices, and their art has only grown in importance as art historians and critics of late-twentieth century art gain access to the documentation and theories

behind this crucial chapter of post-war art. In a direct response and challenge to what they were learning about American avant-garde efforts, Gutai artists used their own experience of abjection (a *national* abjection, it should be noted) to produce their own ground zero (one of the avant-garde groups called itself 'Group Zero,' another, 'Zero Dimension') for the building of a new, international, modern art.

Yoshihara, master or *sensei* of the Gutai group, attracted a group of radical students whom he urged to generate 'a quite new, epoch-making idea … not imagined before the war'.[56] When Yoshihara was joined by the members of Group Zero in 1955 (Shiraga Kazuo, Murakami Saburo, Tanaka Atsuko and Kanayama Akira), the group became committed to ephemeral action, with exhibitable objects produced specifically for these events. Actions at the October 1955 'First Gutai Exhibition' (staged in Tokyo) included Murakami's *Paper Tearing*, in which the artist plunged through stacked frames of stretched paper (later exhibited on their own), and Shiraga's *Challenging Mud*, where visitors viewed the artist writhing in a ton of clay that had been dumped in the courtyard of the exhibition hall (the resulting tortured shapes were also to be considered works of art). Murakami's action was particularly symbolic, since the nature-oriented Shinto belief-system (which had been converted into a state religion during the war, with emperor-worship at its heart) held each substance or form to possess a specific *kami*, or 'spirit of the material.' (This reverence for the *kami* expresses itself in the construction of traditional kimono, for example, where bolts of fabric are cut as little as possible in assembling the garment.) The experience of seeing Murakami's body aggressively plunging through carefully stretched screens of paper would provoke a strong sense of violation in a Japanese audience – an impact far greater, one expects, than the elegant incisions of a Fontana or the cruciform scratches of Tàpies.

Japanese reviewers were frankly unprepared for Gutai's actions: 'We were perplexed, as if we were confronting aliens from Mars'.[57] Indeed, although some of the artists pursued an elemental engagement with 'concrete' and basic materials, others (Tanaka and Kanayama) used technology to make a mechanized art that did seem 'Martian' in the context of Japanese hand-made art traditions (tea ceremony, *raku* pottery, literati calligraphy, bamboo architecture, *ikebana*, garden design). Tanaka's *Electric Dress* and Kanayama's 'automatic' paintings (made by little robots drooling paint on a horizontal canvas) were typical of this 'Martian' aesthetic; non-Gutai artist Nakanishi Natsuyuki's motorization of steel clothespins churning on burned cloth was another. For all this frenzied innovation (1955 saw three separate action-exhibitions by the Gutai group), the 'concreteness' of Gutai's achievement lingers primarily in the residual paintings and objects, which remain after actions and viewers have moved on. Shiraga's enormous canvases are particularly rich as emblems of the relationship between abasement and transcendence in Gutai art.

In his statement 'Only Action', Shiraga explains the levelling of form he intended in the series of large abstractions he began around 1955, which continued through the 1960s (Plate 155); both paintings and statement illustrate the way he conceived of body actions as inaugurating a new art: 'when I decided to be "naked", to shed all conventional ideas – forms flew out the window and techniques slipped

off my painting knife and shattered. In front of me lay an austere road to originality.… Let me do it with my hands, with my fingers. Then … it occurred to me: why not feet? Why don't I paint with my feet?'[58] Shiraga's *Challenging Clay* had been one way to act on this imperative to 'be 'naked', quite literally, as the artist dressed only in underwear on that October day in 1955 when he wrestled with the viscous earth. The untitled painting actions that he staged at the second Gutai exhibition the following year pursued the second imperative. Like Jackson Pollock's methods of production (documented in 1951 by photographs of the American artist making his famous skein paintings) – methods with which the Gutai group were familiar, and to which they explicitly compared their activities – Shiraga worked on an enormous horizontal surface, holding onto a rope for balance and smearing earth-coloured pigment with his bare feet. The horizontality (some say 'baseness') of this method, enacted for the visitor, is significant – particularly since Shiraga produced them on the already implicitly horizontal medium of *paper* (here one is reminded of traditional Asian hand scrolls as well as newspapers, books, letters and other reading material). When the results were exhibited alone, the horizontality of the image's origin would often be alluded to with a footprint – sometimes registered in the painting's upper right-hand corner where a title or calligrapher's seal would appear in more traditional objects of Asian art.

The footprints instantly enabled viewers to see that the pictorial surface was horizontal, and at the same time, intimately related to the human element. But the footprint is also associated with blood-coloured, viscous material (we begin to wonder, is it even *paint?*). A most powerful comparison can be made with Jackson Pollock's *Number 1, 1948* (Plate 156), which bears the painter's handprints, stamped on the upper right corner of the painting. Pollock's handprints, emerging from the apparently chaotic storm of drips and lines of paint, assert the painter's identity and volition, serving also as talismanic evocations of Palaeolithic power. Had he known it (and it is very likely that he did), Shiraga would have understood that Pollock's painting was executed through rhythmic movements around a horizontal plane. The substitution of the foot for the hand is the mark of abjection that connects Shiraga's Gutai work to Europeans such as Tàpies, Burri, and Dubuffet (who were quickly enlisted in common cause with the Japanese through exhibitions and publications supervised by French critics such as Michel Tapié). Yet rather than revealing the regression into an abject or infantile state, photographs of Gutai artists performing their actions show the artists exhibiting enormous physical poise, stamina, and control. To the Westerner unfamiliar with these 'body techniques,' they do not appear Martian at all, but *martial* – the discipline moulding Shiraga's half-naked body is akin to judo or Tai Chi, each force met by a counterforce, each limb's movement balanced by a counter-movement. Confirming its intention to assert an Eastern semiotic, there is even a Buddhist reference in Shiraga's footprint – an allusion to traditional renditions of the Buddha's foot as he attained enlightenment, also referenced by Shiraga's mention of his 'austere road'. In these ways the *basesse* of Shiraga's painting action is catapulted to transcendence: by the grace and control he maintains over the prone image, and by the act of re-orienting it to the vertical position for the purposes of Art.

## The 'triumph' of American painting

Fragments of the post-war histories narrated thus far have mentioned the role played in Europe and Japan by the new painting coming out of New York in the late 1940s and early 1950s, variously termed New York school painting (in explicit analogy to the *Ecole de Paris*) or abstract expressionism (tapping into another legacy, that of early twentieth-century German expressionism or its variant in the hands of the Russian abstractionist, Wassily Kandinsky). While it has been strategically important here to discuss the painting of Europe and Japan before implying a prior American avant-gardism, in fact the web of cross-cultural influences was very dense and all but simultaneous. During and after the Occupation, exchange of information took place through magazines, exhibitions, and artists' travel. In terms of strict art-historical 'priority', Pollock is often credited with the primary breakthrough into abstraction, his working methods documented (through artists' magazines as well as mass-media organs such as *Time* and *Life*), transmitted throughout Europe and Japan, where they had an immediate impact. (Of course abstraction existed outside modern Western painting, and there were precedents in early American modernists as well as in Russian art.) The priority claimed for Pollock stems from his mural-sized ambitions, but these were fuelled in turn by Europeans such as Picasso (whose *Guernica* was on view in Manhattan during the war). Pollock and his compatriots in the New York school were more deeply connected to European modernism than any generation before them. Disruptions and fascist persecutions in Europe had brought to New York Max Ernst, André Breton, Piet Mondrian, Fernand Léger, leading surrealist André Masson (who had experimented with 'automatism' in art as early as 1924), a host of other minor surrealists, and Mexican muralist David Siquieros (who railed against bourgeois easel painting and insisted on working on the floor, or directly on the wall). Rather than simply 'copying' these powerful influences, however, New York painters anxiously negotiated with them – desperately aspiring to international recognition even as they sought to appear uniquely 'American' and hence utterly unprecedented on the international stage.

Jackson Pollock gave a pithy summary of abstract expressionist aesthetics years before producing his characteristic non-objective canvases of dripped enamel paint. Pressed by German modernist Hans Hofmann in 1942 to work from nature, Pollock famously retorted, '*I am nature.*' His response reflects the complex mixture of discourses characterizing the New York school: Jungian psychoanalysis, modernist primitivism, existentialism, nationalism, and the romantic sublime. Like most art movements, abstract expressionism had no hard historical or stylistic boundaries, and was named largely after the fact by people other than the artists making the paintings. It seemed to coalesce as an unnamed style only after the Second World War, when a small group of impoverished middle-aged artists came into view with an 'obvious' alternative to provincial realism; their hard-won abstractions emerged as the victors in a complex struggle to find visual form for the post-war American presence in an international world. At the time, the visibility of what came to be known after 1954 as abstract expressionism was taken as proof of the formal and psychological superiority of the art (one textbook was titled *The Triumph of American Painting*). In place of any aesthetic superiority, revisionist historians have looked to the economic and geopolitical ascendancy of the United States to explain the movement's success. But even within the limited context established thus far, we can see that abstract expressionism offered post-war artists, viewers, and promoters a powerful synthesis. Like *Guernica* or the paintings of Tàpies and Shiraga, the style produced increasingly abstract and non-objective paintings that nonetheless bore the marks of cathartic 'expression'. Such a compromise was enormously appealing in the international sphere of Cold War politics. There was nothing programmatic about this (except after the fact). Individual systems were hammered out by formerly left-wing artists working in relative isolation in New York. They sought to chart a noncommittal course for their production, free from the increasingly rigid demands of communism on the left, and the horrifying rise of McCarthyism on the right. Recognizable subject matter was eliminated in their work, in favour of individual symbolic systems and abstract form – but as with their European models (Pollock in particular was obsessed with the priority of Picasso), their chosen abstractions were nonetheless held to be universally accessible through a variety of means that pulverized language and nation in favour of primitive models of 'collective unconsciousness' (the concept of a universal and innate system of symbolic forms promulgated by Swiss analyst Carl Jung) or intuitive emotional response. Such modes had precedents in earlier modern art, but their confluence in abstract expressionism resulted in a style of painting that seemed so unprecedented that few could connect it to previous artistic movements. A certain anxiety of influence may have been in play as New York supporters downplayed links with German expressionism (with its search for the primitive roots of expression), on the one hand, and the utopian geometric abstraction of Russian suprematists and de Stijl painters, (with their theories about the intrinsic expressivity of colour and form), on the other.

Crucial to the formation of abstract expressionists' tenuous collective identity was the background of the US Government's surprisingly socialist response to global depression in the 1930s. The Federal Art Project had been established as part of the Works Progress Administration in 1935, and its administrators acknowledged that 'artist' was a profession worth supporting (a development unprecedented in American culture). The WPA employed immigrant artists (Arshile Gorky, Willem de Kooning), as well as American-born painters (Lee Krasner, Pollock, and Philip Guston) and even critics (Harold Rosenberg), all of whom would contribute to the genesis and codification of the new abstract mode. Although most of the federally funded murals fell in line with prevailing representational styles (featuring heroic workers, churning assembly lines, and rolling farmland), there was room within the programme for abstraction. Works by Europeans such as de Kooning and Gorky already revealed a sophisticated hunger for European modernism, from the cubists' achievement of a shallow, minimally illusionist space to surrealism's innovative biomorphic abstractions. The living presence of expatriated surrealists in New York further reinforced the importance of the unconscious and the role of automatism in stimulating creativity. But where the surrealists had used automatism as a form of suggestion, to initiate the more conscious process of making poetry or drawings, as practised by the abstract expressionists, automatism was valued as an end in itself

(this is the sense of Pollock's 'I am nature' statement). Claims to work from the unconscious were predicated on a continuum between id and organic expression, and Pollock's first poured paintings (begun in 1947) proclaimed both their natural and automatist origins with titles such as *Galaxy*, *Phosphorescence*, and *Vortex*. Pollock's radical process, documented in photographs that purported to show the 'frenzy of creation' rather than the cliché of artist-with-palette, showed him moving his whole body around a horizontal, unprimed canvas, flinging paint in loops and trails in a rhythmic, repetitive, trancelike dance.

The abstract expressionist subject was thus constructed as a visionary, a solitary and possessed individual in a world of mass formations. But the repeating rhythms of Pollock's skeins could also evoke regimes of automated labour (this was how critic Clement Greenberg sensed its modernity). The much-boasted alienation and anguish of the artist was held to resist everything from fascist totalitarianism to an emerging consumer culture; yet the painting could nicely decorate a modern businessman's apartment. The isolated gestural painter was seen as male, white, and above all, free (a subject position that proved problematic for non-males such as Krasner, or non-whites such as Norman Lewis or Wilfredo Lam). The action painter's volcanic productions could then be taken as both proof and guarantor of democratic liberalism and free speech.

This heightened individualism meshed very well with free market ideologies of global capital, serving the mass formations it was imagined to inoculate itself against. This irony is exemplified by the historical overlap of Michel Tapié's 1958 exhibition 'International Art of a New Era: Informel and Gutai,' which juxtaposed works by Pollock, Yoshihara, and Dubuffet and travelled to Paris, Osaka, and New York, and the simultaneous appearance of a 1958 travelling exhibition 'New American Painting,' which brought Pollock and other compatriots throughout European capitals to exemplify American democratic values. Pollock was, in the former, an explicit antagonist of bureaucratic regimentation; in the latter, he was a vivid emissary of democracy's tolerance of expression during the cultural Cold War. In the Tapié exhibition, Pollock was an international rebel (like the others, ostensibly); in the American exhibition, he was the national avatar of cowboy grit. As we have seen, this kind of slippage was the flip side of modern abstraction and its openness to the viewer – even Picasso, whose *Guernica* retained both imagery and geopolitical title, was not able to completely control the interpretations of his canvas or its potential value for opposing ideologies.

These fates could not have been anticipated by the artists working in cultivated bohemian alienation in wartime New York. Automatism was predicated on the revelation of a deeply private interior world, and American artists emphasized this in statements and through their jealously protected 'signature styles'. The optimism of the 1930s vision of an art linked to its public (expressed both by outsiders such as Mexican muralist Siquieros, and by the US Government's own WPA) had not entirely dissipated, however. Both artists and critics forged connections between the private id and a wider sign system, predicated on popular structural anthropologies (Franz Boas, Ruth Benedict, and Sir James Frazer) as well as psychoanalysis (Freud and Jung). The romantic sublime would be key to these connections, but primitivism came first. Pollock's *Number 1, 1948* united both.

Throughout the 1940s, New York abstract painters had emphasized their works' continuities with both archaic Greek myth and Native American belief systems (continuities clearly charted by Freud's Oedipal narratives and *Totem and Taboo*, reflected in the titles of paintings such as Pollock's two *Totems* from 1947). The long tradition of modernist primitivism thus took a slightly different spin in the American context. New York painters felt themselves to be dwelling in a barbarous age, and experienced their thinking as continuous with the supposedly 'primitive' mind – particularly those putatively 'primitive' minds that were not isolated in some colonial periphery, but deeply woven into American beliefs (from the Algonquin-inspired US Constitution to African diasporal jazz). The artists had only positive associations with such Native American or African themes, but the anthropological theories that they turned to were often deeply racist. The supposedly subconscious process of assimilation in which others' ethnic traits became available for a white-dominated national culture were propounded, for example, by Carl Jung, whose 1930 essay 'Your Negroid and Indian Behaviour: The Primitive Elements in the American Mind' is only one example.[59] The European-derived method of automatism, taken in this context, was thought to reveal to American painters a subconscious already formed by national substrates of African or Native American forms. Picasso could 'perform' an identification with Africa to defy the French artistic and colonial establishment, but the abstract expressionists' tropism toward the 'primitive' could be constructed as the very source of national identity. Thus the American abstract painter Barnett Newman, passionately identifying with coastal tribes such as the Kwakiutl, wrote in 1947: 'To [the Kwakiutl artist] a shape was a living thing, a vehicle for an abstract thought-complex, a carrier of the awesome feelings he felt before the terror of the unknowable. [Now] a new force in American painting … is the modern counterpart of the primitive art impulse.' Insisting that their non-objective paintings offered the accessible equivalent of these highly complex ideographic signifiers, Newman continued, 'For here is a group of artists who are not abstract painters, although working in what is known as the abstract style'.[60] As Tàpies had bid for Spanishness with his Altamira school, Newman's international modernism would be American in a constructed primordial sense.

Newman's remark, consistent with the modernist subjectivity we have referred to in this essay, emphasized that readings of various kinds could be made by viewers – the paintings were non-objective, but had *subjects*. To 'gesture' painters such as Franz Kline or Jackson Pollock, the subject of abstract expressionist painting was the grand narrative of the existential act – the subject, in other words, was the modern self. Pollock's hand prints in *Number 1, 1948* spell this out, relating both to the newly discovered smoke-outlined hands found in Palaeolithic caves, and to the symbolic existentialist act of poet André Malraux, who dove dramatically (was it to drown or to swim?) into the Mediterranean Sea. Even the placement of Pollock's handprints is significant – at the upper right of the swirling mass of dripped skeins of paint, they would be read last (by Western viewers who customarily 'read' an image by scanning it left to right). They recreate, quite literally, the reintegration of self through representation, following a harrowing journey of pictorial disintegration and chaos that is part and parcel of the rhetoric of the sublime.

Pollock spoke little, and wrote less. But Newman and others were at great pains to explain the difference between what they described as the 'meaningless' geometric abstraction of Northern European modernists such as Mondrian and Kandinsky and their own (American) project. Pursuing both figurative and 'non-objective' modes of painting (the first known as 'Action' or 'Gesture,' the second as 'Field'), New York school artists shifted over time from an emphasis on primitive totems, to a discourse of isolated existentialist action, to this final stage of cultural mastery via the sublime. In artist-run periodicals of the time, they used Edmund Burke's quintessentially eighteenth-century meditations to develop a crucial contrast between the specious (supposedly European) search for beauty and the noble (supposedly American) quest for the sublime.[61] Acting only from his agonized internal emotions, the American artist was supposed to create objects that provoked a trajectory of terror and ego dissolution, followed by an aesthetic integration of ego in the end. This sublime trajectory was predicated on the same processes of mythologization, individuation, and personal expression that had animated earlier phases of the movement. As Newman summarized it: 'Instead of making *cathedrals* out of Christ, man, or "life," we are making it [sic] out of ourselves, out of our own feelings.'

As used by Newman, 'man' was not simply a neutral term. Newman (who quoted Kant on the subject) saw the sublime as an exclusively masculine pursuit defined in opposition to the 'feminine' search for beauty. Newman's thinking can be seen to culminate in the first of his large-scale works, the 8 × 18 ft. 'field' painting *Vir Heroicus Sublimis* from 1950. A taut horizontal canvas with a smoothly brushed surface of saturated red, *Vir* is punctuated by a few scant verticals of brushier pinks and browns, as well as one narrow strip of unpainted canvas. Newman called these ruptures in the chromatic field 'zips', and many scholars believe that they were stimulated by post-war New York exhibitions of Swiss sculptor Alberto Giacometti's spindly and cadaverous figures – lone existential men standing isolated in the void. Like so many other abstract expressionists, Newman painted as a 'sublime heroic man,' seeking to enact, rather than depict, (his) contemporary existence. 'The self, terrible and constant, is for me the subject matter of painting and sculpture'.[62]

Sublimity was invoked in these paintings not merely through their titles, nor solely through their forms (or formlessness). It was produced *in the viewer* by implicit and explicit identification with the artists' intense process of creation, particularly in the case of Pollock. 'Jackson broke the ice' (as de Kooning had remarked), establishing through his infrequent statements and even less-frequent interviews that 'On the floor … I feel nearer, more a part of the painting, since this way I can … literally be *in* the painting', or 'When I am *in* my painting, I'm not aware of what I'm doing'.[63] Being lost in the act of painting was comparable to being lost in the act of viewing the painting, rescued, in the end, by the tenuous civilizing effects of title, or the decorous culture of gallery and museum. Pollock's dense skeins of enamel, intermittently soaking into the canvas or standing slightly off the surface in taut whipcords of paint, produced shimmering fields that seem to blur in depth (the soaked first layers) and come into sharp focus in the foreground (the later, unabsorbed layers).

The 'field' painters chose a different route to sublimity. Mark Rothko and Newman both attempted to impose viewing conditions designed to maximize the desired state of absorption: Rothko, by grouping canvases together in fugues of subdued colour; Newman by asking visitors to his 1951 exhibition to stand so close to his enormous canvases that the entire field of vision would be saturated by intense colour. Thus deprived of visual focal points, viewers are engulfed by the overwhelming aesthetic experience that eventually triggers an examination of their own identity.

From the jumble of critical approaches to abstract expressionism during its peak, two divergent interpretations came to dominate, both emerging from the Marxist culture of New York in the 1930s, but with markedly different slants. The first was codified by Harold Rosenberg, who coined the term 'action painting' to describe the risky, existential process captured in the 1951 photographs of Pollock in the process of painting. Describing the canvas as 'an arena in which to act' in 1952, Rosenberg concluded: 'What was to go on the canvas was not a picture but an event'.[64] This existential position had clear resonance with what the Gutai artists would initiate; it also profoundly affected younger artists in the US. For example, Allan Kaprow, who was influenced by Pollock, probably aware of Gutai, and took classes from the avant-garde composer John Cage, introduced an action-oriented art that was known as 'Happenings' in 1958 and evolved into 'performance art', which persisted throughout the rest of the twentieth century. Kaprow's new genre emphasized what he articulated as 'The Legacy of Jackson Pollock:' 'Not satisfied with the *suggestion* through paint of our other senses, we shall utilize the specific substances of sight, sound, movements, people, odors, touch'.[65]

The second interpretation of Pollock's painting emerged as a reaction to this promiscuous mingling of sensuous experiences. In 1940, art critic Clement Greenberg had revisited Gotthold Lessing's *Laokoön*, an eighteenth-century diatribe against confusion within the arts. Greenberg's 1941 response was 'Towards a Newer Laokoön', the first of many influential and controversial pieces in which he argued that modernism, too, was opposed to the confusion resulting from a progressive, even teleological, purification of the arts. In opposition to Rosenberg's later celebration of existential 'action,' Greenberg argued that modernism was responsible for producing appropriate modern subjects. Modernism had to accompany viewers into their experience of a largely urbanized and industrial society, not take them back to imaginary caves. Painting, in Greenberg's formalist view, had a job to do. That job was constrained and intensified by its uniquely visual nature – this was how he celebrated Pollock, whom he described as America's 'greatest living artist' in a British culture magazine in 1947.

Greenberg's teleological view of modernism resonated with the post-war technocrats that managed the Cold War on the American side. Modernism, like democracy, represented progress. It moved in one direction, in pursuit of specific visual qualities including flatness, and in recognition of its aesthetic status as intended for 'eyesight alone'. Greenberg's theories bore curious fruit in the US, provoking the emergence of minimalists and conceptual artists in the late 1960s. These artists took Greenberg's views to a logical extreme, producing what has been termed an 'aesthetic of administration' – a bureaucratization of the senses that resonated rather profoundly with the post-war apparatus of the Pax Americana.[66]

# GLOBAL MODERNISM

## Asian modernism

By the end of the 1990s, it was relatively easy – for someone in Euramerica[67] – to believe that various kinds of modern art work and artists from the non-Euramerican world had been accepted by the art establishment. This seemed to be the case for Asian artists featured in the *Les Magiciens de la Terre* show,[68] at the biennals of Venice and São Paulo, and who were increasingly exhibited in country or area-specific regional shows.[69] Such acceptance might also reflect the incorporation of modern Asian art into the restricting intellectual paradigms of modernity, which were purportedly invented in Euramerica: the position of the centre may have moved, but it remains the centre.

We do not accept either of these premises. Other positions can be brought into focus if we consider two Asian artists of Indian origin and the intellectual musings concerning them. Anish Kapoor is an artist of Indian origin residing in London who has been exhibited at the Venice Biennale in the British pavilion and is the subject of 'major' critical studies by leading Euramerican curators and critics who pride themselves in adopting a global approach. N. N. Rimzon is an Indian artist residing in India who has been exhibited abroad but has received little attention from Euramerican critics despite the fact that his work is related to what is generally accepted as 'Indian'.[70] Yet Rimzon has been exhibited outside both India and Euramerica, in such places as Australia. This example illustrates the differentiation between a vertical, uni-central model of art based on Euramerican canons, and a horizontal, multi-centred discourse between differently constituted centres, none of which claim to constitute a canon.

The difference of position derives ultimately from Euramerica's claim to have invented, and therefore to retain ownership of, modernity. This claim, which could only be valid in a simplistic developmental history, loses its validity the moment we accept that modernity invents itself wherever it is necessary to place the pasts of any given culture or group of cultures into a new context. The principal condition is that these cultures need to – and are capable of – carrying out this process. From this position, it is easy to make the leap to the future-oriented 'relativization' of modernism, or, further, to the complicated and eclectic 're-relativization' of modernity that some call post-modernism. In the specific language of fashion and the street, post-modernism is also called 'retro'.[71] Seen in this light, modernity belongs to Asian artists because they work in societies and cultural discourses that require it. Modernity does not operate by the privilege of transfer from Euramerica or by the valuation of Asian modern art works and artists through their being accepted in Euramerica. Even before we examine the phenomenon of globalization, therefore, we should consider this basic difference in the approach to modernity.

## Affiliation

But if modernity belongs to Asian art cultures because of their own demands, what kind of modernity is it? How did it come into being? How is it to be recognized from inside any particular Asian art culture or from without? If modernity is not 'owned' by the West, does it follow that the kinds of modernity found in some Asian art cultures are radically different or new?

The affiliation of such modernity may be constructed in at least three ways, the full implications of which have yet to be explored. One approach is to see it as a challenge to authority of the established order, that is, as a dialectical relation to the Western world that has imposed modernity. This is the colonial/post-colonial dimension of modernity, according to which modernity is a product of subordination or rejection and revolt. At least theoretically, this implies a lack of authenticity or absence of an internal demand driving Asian modernity since external stimulus is necessary.

A second affiliation involves the grouping of modernities in a family of species derived from an *ur*-species. According to this model, the branches of a tree derive from common ancestors whose different sub-branchings represent (in a Darwinian evolutionary model of development) the adaptations of the species to various conditions in different localities. A variant of this model is to accept the notion of species branching but to view them (in Stephen J. Gould's revisions) not in a hierarchical relationship but in various groupings of variation from the same original set of species that exist *in parallel* and not in 'root' or 'trunk' form.[72]

A third model of affiliation calls for perceiving modernity in art along the lines of heteroglossia (as described by Mikhail Bakhtin),[73] that is different languages in dialogue. According to this model, the dialogistic relation of such art discourses – that is, their perpetual mutual relativization – may be interpreted as a fundamental condition of modernity. Affiliation results because of this common relativization, however such dialogue is achieved. Relativization can operate through the modes provided by colonial domination (India), internal self-development (Japan), and various kinds of quasi-sovereignty, which seek to maintain the unitary identity of discourses even as they are broken down by contact from without (China).

In art history, it has been relatively easy to overlook the different implications of these models, because of the presumed transfer of styles and their ideological constructs from the West to Asia. The transfer and overlaying of technical and symbolic values has diverted attention from the meaning of these transfers (or appropriations) from within, and from the way authenticity has been created for a wholly new and constructed 'tradition' at this interface. 'Tradition' has often been hermeneutically opposed to 'modernity' when the 'traditional' has only been made possible by the 'modern'. But even as the 'modern' has been relativized by its transfer from the West, so the neo-traditional has been secondarily relativized by its constructed discursive difference from the 'modern'. Thus have modern Asian art discourses been constructed: not along the lines of an 'East-West' split but by the process of primary and then secondary relativization, which we will call 'double othering'. This process can act as a relativization or 'othering' between, as exemplified by the distancing of the neo-traditional *Kannon the Compassionate Mother* by Kano Hôgai, 1888, from its 'Japanese' pasts, and further by its separation from the position of near-contemporary Western-style work like *Kannon Riding on a Dragon*, by Harada Naojirô, 1890.[74]

## Histories

Relativization of the past may seem to be the historical position of modernity most easily indicated by the *caesura* in local discourses created by the complete adoption of 'Western' academy realism. In the discourse of interpretation, such a position has tended to make us perceive the onset of modernity as a radically historical disjunction. But on closer examination of the discourse of the art works themselves, it may easily be seen that modernity in several Asian art cultures such as Japan or India did not begin with the transfer of Western-style realism, and indeed had a long prior history in many proto-modern features of local art discourses and structures of the art world.[75] Neither can one ignore the longevity of the links between the pre-histories of modernity in Asia and Euramerica. There is thus neither a caesura in cultural relations nor an absolute rupture in the way art discourses are related to their pasts. It seems that part of the reason why there is a tendency to create such interpretive breaks is that they can be made to duplicate or reflect dichotomies of the Euramerican world, such as imperial/metropolitan and colonial/local. This Manichean world has not been noted for its creation of discursive spaces defined by multiple centres and histories.

Furthermore, what one might call the pervasive Euramerican interpretive mode has tended to see academy realism in a linear series of internal stages such as transfer, assimilation, and transformation. This view has concealed or de-privileged the various kinds of relativization implicit in such processes for an Asian art world and masked the dynamism of appropriation itself. It has concealed how many features of modern discursive change were present inside these transfers. Perhaps the largest shift in art historical interpretation is required by modern Asian art, which requires a move away from the notion of transfer resulting from the dissemination of stylistic models. Interpretation, whether exogenous or endogenous to any art discourse, should take into account the range of relativization processes as they are imbricated within the complex terms: *modernity, modernism, post-modernism*. Any particular stylistic model or congruence among styles is probably the *least* signifying element for the endogenous art discourses involved. More often, there is a kind of co-option by local expressions of international movements, and we would argue that this often occurs very early in the transfer of realism. The direction of this co-option is not principally from the central to the local, which would be the most widespread (and still colonial) perspective. The complexity of this exchange possibly accounts for the perverse late- or post-modernist pleasures to be derived both endogenously and exogenously from Chinese 'popism' of the 1990s such as in the work of Zhang Xiaogang, a discourse which cynically manipulates a surface conventionality in order to sequester a subversive parody safely within.[76]

## Nations

For most Asian cultural discourses, modernism began with the relativization of the past provided by the historical break initiated through colonial or neo-colonial rule. Just as important was the immediate formation of an anti-colonial movement, and corresponding independence struggles toward the founding of a new state. However the new state

claimed dominance over the society and the many cultural discourses within it, such states could legitimately claim to have founded the nation, to have unified its many discourses, and in most cases to have provided the leader of the people. The modernist striving for a desired future articulated between a leader and a people became a frequent subject for pictorial representation. This has historically been so much the case that one might postulate *the* thematic of modern Asian art to have been the allegorizing of the new nation through representations of the new leader, and often of the very people who supported him. There is no doubt that these *male* figures (by male artists) seek to articulate the masculinist privilege of serving the nation.[77] Alongside them stands the *female* figure of the mother, or of multiple types of women as repositories of a variety of national values, or of woman as a leader of the masses in the self-sacrificing figure of a toiling intellectual. These counter-allegories act as feminizing counterparts to the masculine nation-builders, even if such female allegorical figures can only rarely be described as feminist in intention.[78]

Two conditions seem to have changed the possibility for this type of national allegory. One is the success of the movements under or against colonialism, where nationalism (following, in most cases, colonial maps) survived as a strategy for creating a repertory of ideal figures in a national imaginary in a rapidly de-colonizing world. This can result in a kind of semantic exhaustion where the use and re-use of a particular metaphor, like Chairman Mao as Great Helmsman, turns into a saturated metonym, a kind of image coinage whose value resides in the currency system rather than in any particular image. A second, and usually consecutive, condition occurs where the colonial or the reaction against it only survives as a dim echo in a national imagination preoccupied with negotiating the post-colonial terms of its relationship to a globalizing world. Thus stand the agonized, repeated faces of Philippine peasants in works by Alvorado Nunelucio looking out of the frames of their images.[79] Through the slightly hallucinatory effect of their black outlines and primary colours, they flicker like alternative TV pictures, working to subvert the very fractioning forces that place them in a world economy and separate them from their former lateral solidarity as part of a Philippine 'nation'.

## Mediators

Art history, or at least any history of modern art, cannot escape the possibility that it might serve as an unintentional cultural critique. Any exogenous or endogenous construction of a modern, modernist, post-modernist or simply contemporary art in Asia will necessarily favour some kinds of art over others. But in a world promoting close communication between art cultures, the figures who have normally provided these kinds of assessments in various functional domains – critics, curators, journalists, art historians – are always serving to re-position the 'new'. They have an exogenous mediating and consecrating function and are assisted in this task by new patterns of international exchange and communication.

The endogenous role of a critic, curator or dealer in mediating and sometimes forming a group of conceptual perspectives around a cohort of disparately arranged artists is well known in Euramerica. It has also been a significant

feature of Asian modernity, as illustrated by the role played at different times by Geeta Kapur in India, Li Xianting in China or Nakahara Yfsuke in Japan.[80] The important feature of such critics, however well informed they may be about international and exogenous art movements or by their own personal experience, is that they work from within a set of cultural discourses from which they construct their own centre. But the late twentieth century has also seen the advent of more specifically 'interface' critics, curators, and dealers who help to transfer supposedly scarce knowledge and work from the endogenous to the exogenous levels. There is no doubt that these mediators have played a significant role in presenting East Asian art cultures in international art exhibitions, and here the position of Nanjô Fumio (and more recently of Hou Hanru in China) is noteworthy.[81] But if such mediators play an important role in introducing different types of Asian art into Euramerican discourses, which otherwise might ignore them, such 'gatekeepers' also reflect a minority opinion or a selective representation against the very complexity of the endogenous discourses they purport to represent to the exogenous.[82] In other words, for an art history of modernity that includes Asian art as one type of non-Euramerican practices, it would be fallacious to assume this could wholly or even partially be based on the art introduced from such mediators to the international level, even under the ambiguous label of 'contemporary practice'.[83] The difficult but rewarding work of examining from within each endogenous discourse is the basis for an art history of other modernities, not the post-facto hypothesizing of such a history from such works as have been articulated on exogenous levels.

Some will argue that the global, exogenous level of practice, of the distribution of works and of the career-cycling of artists has long ago penetrated the endogenous. Yet, many artists, some the most rooted in their endogenous discourses such as Rabindranath Tagore, have continuously paid attention to the international scene, even though it was previously organized by the same colonialism from which they were attempting to escape. If modernism involves relativization of the past and represents a kind of reflexivity that elevates future orientations to the level of formal subjectivity, and if we were to attribute hermeneutic sovereignty to the global level, then that relativization would disappear or become a mere imitation of itself. This would entail reproducing – even from a supposedly progressive position – the structure of central super-ordination over the local (now abstracted onto a 'global' level), which the rich variety of practice made possible by modernism had the potential to resist, subvert, or at least circumvent. Whatever we consider to be the role of globalizing forces in the late twentieth century, an Asian history of modern art would first have to construct what conceptually and pragmatically links its own discourses to the local.

## COMMODITY-BASED ART AND GLOBAL CULTURE

John Clark claims that the complex dialogue between international modernity and local culture, as well as the process of self-relativization we call 'modernism', have their temporal origin in colonialism. Much of this chapter has alluded to that dynamic process. Returning to the sphere of Euro-American modernism (as defined by Clark), we can see that the exportation of Western values did not terminate with the break-up of colonies in the wake of the Second World War; nor did hybridization cease. On the contrary, US and European efforts to extend capitalist 'spheres of influence' shifted from the military and political arenas to cultural and economic affairs. American abstract expressionism was the official face of liberal democratic tolerance; equally influential, though unofficial, were the brightly packaged commodities and attendant commodity-based art that burgeoned in the pivotal decade of the 1960s.

By 1958, when New York-based artist Robert Rauschenberg used three trademarked beverage bottles in his *Coca-Cola Plan* (Plate 157), their shape was known to a large part of the world's population. Flanked by silvery wings, they form a classical order of fluted commodity caryatids coloured with drips of paint. Below the bottles, Rauschenberg placed a spherical wooden finial marked with horizontal lines and tilted slightly to suggest a globe. Thus, *Coca-Cola Plan* seems to target global fame by riding on the crest of an increasingly worldwide commodity culture (national pride of the US post-war economy).

Rauschenberg's global ambitions were almost immediately endorsed when this assemblage was acquired by Italian Count Giuseppe Panza di Biumo. The cultural space mapped by such exchanges can be described as an 'imagined community' in which nations and indeed, the very notion of the 'inter-national' might be produced. Particularly salient was the non-narrative *iconic* visual culture produced during the decade of the 1960s, which opened a possibility, however brief, for artists to navigate in a modern world without borders, beyond the limits of language, unified by fantasies of plenty emanating from the US and diffused throughout the capitalist 'free world'.

There was an underlying shift in art-world systems that facilitated such fantasies: the sudden emergence of a major art market in New York. Typical of the global infrastructure that this market represented was Italian-born art dealer Leo Castelli, whose New York gallery became a significant contributor to the local and international economy and who served as a model for other dealers who wanted to establish ties with European collectors. Castelli proved that a dealer could produce an imagined international community when he helped Rauschenberg, and the United States, take grand prize at the 1964 Venice Biennale (shortly after Panza had purchased the artist's *Coca-Cola Plan*). The potential internationalism of Rauschenberg's work was inserted into a theatre of nationalist politics and ideology (the national pavilions at the Biennale). The European response to Rauschenberg's victory was little short of outrage, but this was undoubtedly encouraged by Castelli's blatantly provocative publicity campaign that appeared in art magazines during the biennale year. Castelli's advertisement featured a map of Europe studded with names of his gallery's artists, clustered around various art capitols. Probably intended to indicate cities where his artists' works were on view, in the Cold War context, the map was interpreted as a plan for the European 'conquest' of Castelli's army of American artists.

Rauschenberg was a controversial choice to receive the biennale's grand prize, because of his age (39) and the fact that he was relatively unknown in Europe. But as early as 1955, the recurrent themes found in his work had foreshadowed his global ambitions. Against the uncompromising individualism and sublimity that

characterized earlier generations of Euro-American painters, Rauschenberg offered what was described as a 'flatbed aesthetic' – the canvas serving as support to ephemeral objects, images, advertising fragments, and other flotsam and jetsam from a restless world. Like the dada productions to which it was compared, but incomparably more cheerful, Rauschenberg's assemblages had the look of practical devices, a tinkerer's *bricolage*. Perhaps it was the very 'innocence' of these combined works that appealed to government officials eager to champion their country's culture. At the same time, Rauschenberg's works were accessible to a cosmopolitan international audience craving humour. Rauschenberg's ambiguous icon inaugurated a commodity-based art that both mocked American business and looked like friendly votives to its newly 'global' religion.

*Coca-Cola Plan* had been preceded by works that depict global cultural conquest. In *Small Rebus*, for example (from 1956), Rauschenberg placed two facing maps in the middle of the canvas. The left-hand fragment showed a portion of the US (significantly, the 'heartland' so often ideologically presented as the 'true' America), linked visually to a nearby smattering of grey drips and brushstrokes. Juxtaposed on the right (or 'to the East') was a fragment of a map of Europe: the Warsaw Pact countries, veiled under a square of striped gauze fabric. Here, Rauschenberg offered a witty, visual summary of wider arguments being produced in US cultural discourse: the abstract expressionist brushstrokes on the left do not obscure the heartland, but complement and frame it, guiding the gaze. The happy pairing of democracy and abstract art that politicians celebrated in rhetoric found form in paint and collage, facing off against the dark regimentation of artists under the rule of the Soviet bloc (here expressed as a 'block' of fabric constructing a visual prison of black bars). With varying degrees of sophistication, defenders of abstract expressionism had long argued that the seemingly chaotic brushstrokes were neither mad nor 'communistic,' but manly marks of a generously tolerated individualism. Rauschenberg's commentary in *Small Rebus* is more ambivalent – his 'national' brushstrokes are random-looking drips, rendered in an industrial battleship grey.

Similarly, Rauschenberg's fellow artist Jasper Johns (who was then making his 'map' paintings from a template provided by Rauschenberg) produced an ambiguous reading of American freedom. The national style, abstract expressionism, was wedded to the national territory in Johns's seemingly simple transcriptions of a student's map of the continental US. Similarly, Johns's flag paintings presented the pre-1950s American flag – utterly frontal, it was a flag made of paint as much as a painting of a flag. These were clearly nationalist pictures, and indeed, the masthead of the left-wing journal *The Nation* (where Greenberg published his modernist criticism) is clearly visible under the encaustic paint. But Johns's choice of this translucent medium also 'freezes' the abstract expressionist brushstroke, that crucial element in the beloved national style. The free gesture becomes a tidy set of strokes – transportable, replicable, 'canned' pictorial units that can appear as packaged as the commodities Rauschenberg was assembling into art. Johns's repetition of these national subjects-turned-objects (in many painted and printed versions) seemed to confirm the chilly emptiness of their iconic nature.

Ironic or affirmative? The modernist emphasis on meaning-in-the-viewer gave rise to multiple codes. Rooted

in the Cold War climate, the works of these artists' were closely related to the nationalist discourses that were occurring at the most subtle and sophisticated levels of the United States' embattled intellectual community. In trying to define 'the liberating quality of abstract art' for a group of art professionals in 1957, for example, the medieval art historian Meyer Schapiro produced a vision of abstraction closely associated with abstract expressionism (rather than collage, montage, geometry, etc.) – and he located its model of heroic individualism in the paint itself:

> Hence the great importance of the mark, the stroke, the brush, the drip, the quality of the substance of the paint itself, and the surface of the canvas as a texture and field of operation – all ... means of affirming the individual in opposition to the contrary qualities of the ordinary experience of working and doing.[84]

Accordingly the Warsaw Pact artists trapped behind bars within Rauschenberg's map in *Small Rebus* would be perceived as imprisoned by such 'ordinary experiences, of working and doing'.

However, heroic individualism was not the only exported product of American culture: in the 1950s, commodity culture emerged with great economic clout and fuelled passionate Cold War cultural debates. Abstract expressionism was regarded as demonstrating 'the true meaning of free democracy' on the world stage, aligning itself with 'high art' and aspiring to join the grand traditions of European painting. The movements that replaced it – first neo-dada, then pop, appearing in England, Germany, Italy and France as well as the US – troubled intellectuals concerned about the homogenization of unique national styles, not to mention the destabilization of high art by mass culture. (Except perhaps in the Soviet Union, where American pop art could be enjoyed as final proof of bourgeois decadence.) Even in the US, critics blasted pop art for echoing 'the crassness, the vulgarity, [and] the depressing tawdriness of modern advertising art'.[85] In such strident critiques, observers voiced their true fears: that the commodity-based art emerging in the late 1950s would draw unwanted attention to that *other* American export, the commodity itself – now formulated as crucial to the post-war global economy, but no basis for US aspirations to high culture. Rauschenberg was clearly one of the guilty parties in setting the stage for the turn from heroic (and nationally 'American') individualism to the low internationalist impulses behind capitalist commodity culture. But from the perspective of many artists, the globalism embodied by the 1960s commodity was just the ticket – it was all part of the plan (the *Coca-Cola Plan*).

Rauschenberg had called his enigmatic objects 'combine paintings,' as if (like Eli Whitney's cotton gin and the later combine harvester) he had taken French research (here cubist collage and assemblage) and put it into production. Precedents were clearly Braque's and Picasso's cubist collages and assemblages like *Guitar* or the surrealists' experiments with paintings and constructions that combined images and objects in mysterious ways. Rauschenberg stripped these precedents of their poetic eroticism and their evocations of the 'primitive'. He left the aggressive worldliness of his objects intact. Nothing in Rauschenberg's assemblage is not pre-fabricated, except the drawing of the 'Plan' itself, and that 'blueprint' or plan suggests merely a

reproduction of some mass-produced image. Indeed, *Coca-Cola Plan* announces the scale of its ambitions: the indicated dimensions on the sketch at the top would produce a canvas comparable in size to the monumental Pollocks, Rothkos and Klines then touring Europe in the Modern's 'New American Painting' show. The intended image remains unknown (it might even have been empty, as in one of Rauschenberg's earlier White paintings) – but we could imagine satisfying this image with any of Warhol's early 1960s Coca-Cola paintings, their semi-filled iconic bottle forms silk-screened across the canvas in rank and file, like an army of commodities.

Coca-Cola (and its competitor, Pepsi) had conquered the visual culture of Rauschenberg's generation, and business news reports of the 1960s discussed how the two corporations had divided up the globe, one taking China and the other Russia. Warhol declaimed that Coca-Cola provided the class leveller that communism never could: 'It's happening here all by itself without being under a strict government, [so] why can't it work without being communist?', and later, 'the President drinks Coke, Liz Taylor drinks Coke, and just think, you can drink Coke, too.'[86] By 1961, Coca-Cola was sold in 115 countries at the rate of more than 65 million servings a day; *Time* magazine's editors broke precedent to feature Coke on their cover in 1951, reasoning that '[Coca-Cola provides] simpler, sharper evidence than the Marshall Plan or a Voice of America broadcast that the US [has] gone out into the world to stay'.[87] Right after the war, Coca-Cola's ad campaign had incorporated the slogan 'Coca-Cola … along the highway to anywhere.' Increasingly in the post-war frame, 'anywhere' meant *anywhere on earth*.

Clearly, other countries' artists and critics were not so optimistic about the 'Coca-Cola Plan.' Marisol, a Venezuelan sculptor then living in New York, made her simple but devastating critique in the form of a cast of a woman's mouth and nose, displayed with the top third of an up-ended Coca-Cola bottle thrust deep into her mouth. The work's title, *Love*, conveys considerable irony, given the explicit and unequal sexual power mapped onto this consumer/commodity exchange. Equally explicit is Japanese artist Ushio Shinohara's 1964 assemblage *Drink More* (now in the Yokohama art museum). Here, the complementary colours of an American flag (green stripes and orange stars in place of red, white and blue) appear in the background as a plaster hand thrusts a Coke bottle through the canvas. Crude stencilled letters enjoining viewers to 'drink more' reveal the nationalist economy working behind the 'global' facade of commodity culture. This form of critique continued into the 1990s, specifically around the thematic globalization of Coca-Cola, in works by artists such as Wang Guangyi, whose 'Great Castigation Series' from the early 1990s (in particular *Great Castigation Series: Coca-Cola*, 1993) links the ideology industry to the image factories of commodity culture. Wang's canvas displays the icons of Red Chinese revolutionaries in a heroic pose between red revolutionary flag and the red background of the Coca-Cola logo.

These obsessions in relation to a single global commodity icon can be multiplied many times over, forming the tips of many icebergs. But Coca-Cola was perhaps the dominant emblem of global (US) capital. One British art critic, presenting Coke's takeover in the standard terms of its affront to European civilization (although, as we have seen, its reach spread much farther), wrote the following in a 1964 *London Times* article titled 'Art in a Coke Climate':

The point is not whether Coca-Cola culture is wiser and nicer than wine culture: the point is that it is a culture – a set of tribal tastes and customs which implies certain values and attitudes and a conception of what life could ideally mean.... More people having a good time than have ever had a good time before. A taste for vicarious pleasure as well as vicarious cooking. Brand advertising everywhere … A Promethean faith that nature is conquerable … expendability … standardization.[88]

In Rauschenberg's evocation of the Promethean myth, there is no Zeus to challenge his hubris. Rauschenberg's *Coca-Cola Plan* of the late 1950s was anticipatory and naive; by the mid-1960s, artists such as Marisol or Shinohara were more nuanced in their understanding of the double-edges of commodity imagery. Rauschenberg's combine, with its wings unfurled, presents the moral equivalent of wars' victory – an ironic 'junk art' allusion to the triumphant Hellenistic Victory of Samothrace, one of the highlights of the Louvre. It was logical to tie this 'victory' to Coca-Cola's marketing icon. The bottle's shape was patented in 1960, as if in recognition of the increasingly visual and iconic form necessitated for 'corporate identity' to function in a multi-lingual world. In the 1960s, minimalist artists in the US had been drawn to this visual culture of the corporate logotype, seeking the same instant recognition and 'brand-name' identity in their clear, crisp forms.

What is interesting about the use of icons appropriated from American corporate culture throughout this period (and the widespread move toward icon status) was a feature that most artists (including Marisol, Shinohara, and Wang) failed to address – increasingly, *art* obeyed the logic of commodities as well. Modernism's emphasis on individual originality and recognizable artistic 'style' ran parallel to commodity culture's imperative for market share; to be successful, artists from Picasso on had to develop their 'brand.'

In the efforts of American government officials to promote abstract expressionism, a very diverse group of styles was promoted as *national* 'brands.' Rauschenberg had alluded to this dilemma by identifying abstract expressionism as a commodity in its own right, just as exportable and potentially international as Coca-Cola. This point is made deftly and succinctly by the brushstrokes on the bottles above the globe in *Coca-Cola Plan*: these strokes of primary colour on Coca-Cola's advertising ingenuity are themselves advertisements for a certain type of genius. By the time Rauschenberg presented his ironic, quasi-imperialistic plan, commodity and culture had fused more deeply than pop art's worst critics had feared. The new entity – commoditized culture – had come to play perhaps the biggest role of all in the production of a new *inter*national imagination, as the *Coca-Cola Plan*'s owner, Giuseppe Panza, seemed to agree.

Panza's acquisition of *Coca-Cola Plan* suggested that at least one Italian lawyer and businessman could see himself in the aspiring internationalism of American commodity culture and culture-as-commodity, even if he were only sharing the artist's ambivalent irony about that situation. How Panza became convinced that his cultural future lay in the hands of American artists is a case study of the national and international components of an ever-evolving corpus of modern art. In weighing in with Rauschenberg's work, Panza turned his back on the austere struggles of European

painting (he had early bought both Fautrier and Tàpies); by believing Rauschenberg's vision of global triumph, Panza contributed toward that goal.

As Panza well knew, the Italian futurists had announced similar designs on European culture during and after the first World War. After 1945, Italian modernism seemed in even deeper stagnation. Seduced by a posturing imperial Duce and ashamed of their failure to hold on to even the most rudimentary colonial outposts, Italian modernists seemed to have few legitimate pathways to an international future. Post-war Marxism offered no compelling artistic styles, and the sober pre-war realism of an artist such as Giorgio Morandi had been tainted by its exploitation by the Fascist cause. Even the futurists ended up painting landscapes and madonnas. By leaning toward progress, Panza had no affection for these rural pieties, and for the view they seemed to propose of Italy's future as a continuation of its rural past.

Just how bleak cultural prospects appeared to this industrially progressive modern society can be intuited from the name given to the first post-war Italian movement that aspired to international status: *arte povera*. Artists such as Giuseppe Penone, Jannis Kounellis, and Mario Merz explicitly sought to work with simple everyday or natural materials. Despite the success of this group of avant-garde artists, their work reflected a refugee sensibility, more consonant with the abjection of an earlier generation (such as Fautrier, Burri, or Tàpies). The humility of arte povera works (carved potatoes, flayed trees, lettuce, mud igloos) seemed directed at some imagined Italian primitive state rather than the future envisioned by Italy's new managerial elite. Or at least that was Panza's conclusion: 'I saw a lot of work by the *Arte Povera* artists', he recalls. '[They] were interesting to me ... they had an international value.... But ... I decided to remain concentrated on the Americans, not the Italians'.[89]

Encouraging Panza's view of a more technocratic future were erudite Italian industry magazines such as *Civiltà delle Macchine* (The Civilization of Machinery). Here Panza saw his first example of American abstract expressionism, which he immediately bought. Recalling the shock of seeing reproductions of a Franz Kline painting and industrial engineering projects, Panza remarked that the work looked 'like a steel structure, only broken'. It is significant that the essay on Kline explicitly connected this New York school painter to Japanese master calligraphers, declaring: 'Perhaps it is too soon to say how far these images in black and white can go, to what extent they can be symbols and modes of our reality, but we can safely acknowledge them to be our time, our life, our poetry'.[90] The 'our' here is not the Italian citizen *per se*, but the reader of *Civiltà* – an international businessman of the world, seeking a newly global cultural imaginary rather than specifically 'national' forms.

The view of American commodity-based art and art-as-commodity initiating the global 'Coca-Cola Plan' weakened the very substantial critique of US hegemony only touched upon in discussions of Marisol, Shinohara and others. Eventually, such critiques became impossible to ignore, gathering force throughout the 1960s and focusing precisely on the twin fronts of commodity culture and military operations (particularly at a time when the US replaced French colonial administrators in Viet Nam). Panza could explain his Americanophilia by observing that 'in some way the Second World War was the end of Europe',[91] and

Rauschenberg outfitted that cultural imagination with its icon, but the situation was very short-lived. On joint fronts, post-modern and post-colonial art and theory began to empty 'nation' of its infusing power in modern art.

## POST-COLONIAL, POST-MODERN

Many scholars and cultural critics have often viewed Western values and commodity culture as if they blasted from the centre of the capitalist 'free' world out to its neo-colonial fringes. But nowadays, such dynamics are believed to be far more complex. Images and objects began to assume unusual mobility during the 1960s, and the ideologies supposedly inherent in such signs appeared malleable and independent of an instrumental economy. Some French theorists found utopian significance in this shift: Guy Debord examined the 'society of the spectacle'; Michel Foucault, Gilles Deleuze, and others influenced by the revolutionary spirit of May 1968, theorized about dealing with power by manipulating its representations; and Frantz Fanon analysed the colonial mind. Artists were part of such attacks on 'master narratives' (as post-modern theorist Jean-François Lyotard called them), and the nationalism and internationalism embedded in modern art began to fragment as well.

Artists such as Robert Smithson (a 'nomad' from the US) and Hélio Oiticica (a 'nomad' from Brazil) illustrate this development. Such artists definitively disoriented modernism's magisterial gaze and the nationalism it could fuel. These two artists, who worked in New York in the late 1960s unaware of each other's existence, both addressed issues of nation, place, and global commodity culture that artists in Rauschenberg's generation had identified a decade earlier. The works Smithson called 'mirror displacements' (Plate 158) are points of entry into this post-modernist's reflections on space, place, and nation. That same year, Oiticica first transplanted his installation *Tropicália* to London's Whitechapel Art Gallery and confronted the challenge of making tropical culture readable without tourism. Both these 'transplantations' intended to disorientate viewers and turn them quite literally away from complacent *ideés reçues* and from the kinds of certainties produced to secure notions of *nation* – against the cultural ideas routinely produced by tourism, through the consumption of commodities, and via art. Smithson and Oiticica participated in the late 1960s transformation in which artists abandoned what seemed the false promise of *inter*nationalism, and sought a global universalism against language, against the stability of earth, and against constructed fundamental notions such as ethnicity, race, and even time.

Born in rural New Jersey rather than the art capital of New York, Smithson used his knowledge of hinterlands to stage hard-hitting critiques of the centre. Most famously, his *Earthworks*, as he named them, initiated a movement in which artists produced monumental or ephemeral incursions in distant areas that could not be contained by the art world's galleries and museums. Created in deserts, abandoned quarries, frozen rivers, and fallow fields, such site-specific works were part of the crucial late 1960s shift from object to discourse.

As part of this increasing emphasis on conceptualization and documentation (rather than object), Smithson's essays

constituted an integral aspect of his art. His piece in the Yucatan bears images but also words that refer to the colonial place names. The creation of names by the colonial power is presented as a false mirror, and juxtaposed with Smithson's own projects dealing with displacement and fiction. Concerning *The Tourist Guide and Directory of Yucatan-Campeche*, Smithson writes:

> On its cover was a crude drawing depicting the Spaniards initial encounter with the Mayans.... [with the words] 'UY U TAN A KIN PECH' ('*listen how they talk*') EXCLAIMED THE MAYANS ON HEARING THE SPANISH LANGUAGE,... 'YUCATAN CAMPECHE,' REPEATED THE SPANIARDS.[92]

In the primary invocation of 'Yucatan' (a transliterated Mayan phrase that also means 'I don't understand'), Smithson produces the same ambiguities that characterized his site/non-site works executed the previous year. The site/non-site series began in art magazine articles and gallery shows that designated sites at a specific location (e.g. a slate quarry near Bangor, Pennsylvania), and presented their boxed, mapped, and photographic remnants as elements of a non-site that was described as 'removed' from the site and relocated to the urban-based art gallery. The dialectic between centre and periphery became a central issue in Smithson's work. Staged initially as discursive projects, the site/non-site works were recast by the Yucatan essay as elements in an imaginary geographical and transnational context, a globalization of conceptual acts.

Smithson's descriptions of the mirror-displacements, ephemeral installations photographed in Central America's Yucatan peninsula and published in the prestigious American art journal *Artforum*, made it clear that all efforts at mapping and representation are doomed to fail. The mirrors, as shimmering, evanescent inversions and refractions of the surroundings, might seem to be explained by Smithson's magazine text, but that supplement is itself riddled with mirrors and shadowy voices: *Tezcatlipoca* (not Mayan, as Smithson asserts, but Aztec), introduced by Smithson as 'demiurge of the smoking-mirror,' appears in the rear-view mirror of Smithson's rented Dodge Dart to warn, 'All those guide books are of no use ... You must travel at random ... you risk getting lost in the thickets, but that is the only way to make art.'

As such Delphic stagings suggest, Smithson's 'Incidents of Mirror-Travel' can be read as a standard primitive pilgrimage to the primordial Other, much like John Lloyd Stephens's 1843 volumes, *Incidents of Travel in Yucatán* (from which the well-read Smithson borrowed his title). But the Yucatan sites explored by Smithson are hardly primordial Edens. As the artist/author relates, the first displacement was staged on land turned to ash for agriculture; the second deployed in a shallow quarry found in 'a suburb of Uxmal;' the sixth described in conjunction with a Mexican book of matches bearing the art commodity Venus de Milo on one side and Breugel's *The Blind Leading the Blind* on the other. The last mirror displacement, in which the square silver plates of glass are distributed around the roots of a mangrove tree, reminds us of Smithson's commentary on the subject of 'nature:'

> There are those who say 'that's getting close to nature.' But what is meant by such 'nature' is anything but

natural. When the conscious artist perceives 'nature' everywhere he starts detecting falsity in the apparent thickets, in the appearance of the real.... [Art] sustains itself not on differentiation, but de-differentiation, not on creation but decreation, not on nature but denaturalisation.[93]

In this quote, we could replace 'nature' with 'nation.' Smithson's new vision was intended to examine the naming process, traditionally used to designate national or colonial subjects.

In his ignorance of Central American languages and theologies, Smithson was very much an American tourist. Still, even a cursory reading of the Yucatan project suggests how far the viewer has been taken from Rauschenberg's cocky, if ironic, certainties. From an America that imagined itself to be at the centre of a new world order, the master of its culture, the tamer of its wilderness, and the bearer of 'good news' for the world, Smithson's work alludes to a disoriented, displaced nation increasingly aware of the ambiguities at its core. The mirrors here are 'rectangles of uncertainty in the Yucatan,' as Smithson put it, refractions of suburbs and ash heaps, not masterful representations of a pure yet colonized 'nature' that anchors utopian 'nation' in place. In a final globalizing reflection on his own wanderings, the artist notes that other sites in upstate New York and Florida could be connected to the Yucatan displacement sites by means of lines drawn on a map. This classic modern gesture of knowing and owning is immediately jarred by the artist's query:

> Are they totems of a rootless condition that relate to one another? Do they mark a dizzy path from one doubtful point to another? Is this a mode of travel that does not in the least try to establish a coherent coming and going between the here and the there? Perhaps they are dislocated 'North and South poles' marking peripheral places, Polar Regions of the mind ... that have slipped from the geographical moorings of the world's axis. Central points that evade being central.... If you visit the sites... you will find nothing but memory traces, for ... the mirrors are [now] somewhere in New York.... It is the dimension of absence that remains to be found. Yucatan is elsewhere.[94]

As Smithson's works forced viewers to recognize, cherished notions of place, roots, race and nation are nothing more than phantasmagorical projections on a map whose coordinates are vague and blurry. 'Listen how they talk' and 'I don't understand' become names for the Other, but by the late 1960s this artist already knew they could better be used to describe his own uncertainty.

The Brazilian artist Hélio Oiticica is equally intelligent, and complex. By 1965, when Smithson was still flirting with abstract minimal art, Oiticica was just beginning to theorize his extraordinarily embodied, kinetic, and ephemeral *Parangolés*, those reclamations of samba and street performance where, as Oiticica described it, 'the action is the pure expressive manifestation of the work'.[95] Son of an eminent scientist and grandson of an anarchist, Oiticica had a rich and complex background, as well as a distinctly critical relation to the colonial foundation of his own nation. In his important performance works, and in the periodically recreated installation *Tropicália*, Oiticica's

frame of reference was the uneven constructivism of the developing world (whose flaws he knew intimately). His work was inspired by the African-Brazilian samba dancers, and the cast-off constructions of the *favelas*. Transformed by the samba school and the makeshift structures of the Rio shantytown where he lived at the time, Oiticica produced the *Tropicália* installation and the *Parangolé* performance works against the myth of the melting pot of Brazilian culture and against the false stereotypes fabricated by the Brazilian state. It was Oiticica's aim to reveal, as Smithson had, the infinite differences beneath modernism's relations with its Others and the evolving nature of certain dichotomies (nation/other, modernist/primitive, First World/Third World).

Renamed *Eden*, Oiticica's *Tropicália* was installed in London a few years after its inauguration in São Paulo. Like the spontaneous, anonymous constructions the artist photographed in Brazil's urban centres, *Tropicália* was meant to provide a site for what Oiticica called 'Cre-leisure,' (from the Portuguese word meaning 'belief,' *crer*, as well as 'to create'). Visitors laughed as they travelled through Oiticica's fun house, moving in bared feet from straw to sand, from black tents piped with *bossa nova* to translucent scrims, the scent of humid air heavy with leafy plants. 'COME AND GO, STOP, STAY, WANDER, PLAY' were the artist's instructions, but at the end of the visitors' stay in *Tropicália*, in the middle of Oiticica's 'labyrinth,' a television was installed, its screen described by the artist as a cannibal that 'devours the participant, because it is more active than his sensory creating'. In the heart of darkness, then, Oiticica placed not the savage (noble or otherwise), but the sinister light of First World commodity culture with its unequal cultural exchange. What is crucial to the concept of the TV cannibal, however, is Oiticica's theoretical framework: the extraordinary Brazilian response to colonialism known as *antropofagia*. This theory regards modernism in terms of 'hybridization'. But in Brazil in the 1920s, there was nothing gentle or gradual about the process: *antropofagia* referred to a process of *cultural* cannibalism in which the colonized devour elements of the colonizers' culture, both killing and literally incorporating them in a mysterious Dionysian process of transubstantiation.

Anthropophagic transubstantiation implied the transnational as well. For if the nation defines itself through relation to its imagined Others – whether internal Indian savages or external barbarians at the gate – to consume and be consumed in turn establishes a less controllable metabolism. Rather than the alloy envisioned by 'the melting pot', Oiticica and other late artists of the 1960s created an ambiguous molecular dynamic of exchange. When identifying a chunk of Brazilian asphalt as a 'Manhattan Brutalist Object semi-trouvé,' for example, or when making line drawings of snortable cocaine on images of American mass culture icons (in Cosmococa), Oiticica shuffled entire decks of cultural signifiers and imaginary locales. 'Manhattan, USA', installed in his Rio bathroom along with 'Kyoto, Japan', formed Oiticica's response to the nation-mongering then going on at the São Paulo Bienale, one of those periodic opportunities for chauvinism that Robert Smithson had also chosen to boycott some ten years earlier. The exchange of locations and the transvaluation of the commodity were addressed even more deeply by *Cosmococa*, Oiticica's quasi-cinematic participatory performance piece, planned in collaboration with Brazilian

filmmaker Neville d'Almeida in the early 1970s. Images of Marilyn Monroe or African-American rock star Jimi Hendrix were shown wearing 'masks' drawn in lines of cocaine; these images were projected in galleries strung with hammocks for the 'cre-leisure' of gallery visitors. For Oiticica, issues of consumption and commodity were fully addressed by this deeply personal, *antropofagista* commingling of South American narcotics and masked North American celebrity icons, commoditized image to be contemplated and consumed along with the cocaine – both eternally renewed for further consumption.

Other Central and South American artists were exploring this kind of relationship at almost the same time: Colombian Antonio Caro, who used a traditional painted canvas and the Coca-Cola logo to paint his nation's name – the vocabulary of pop used to reveal the illegal 'coca' sustaining his nation's economy and linking it to the First World economy of the North. More conceptually intriguing was the project of Cildo Meireles, another Brazilian, who chose physical Coca-Cola bottles as objects in his 1970 project *Insertes em circuitos ideológicos* (Insertions into Ideological Circuits). Meireles's important project was a powerful example of post-modern appropriation, far earlier than such developments in the US, and a sophisticated piece of conceptual art. Rather than simply take the messages, objects, or icons of the US commodity culture as subjects (as 1980s 'appropriation artists' working out of New York would do), the artist here temporarily 'inserts' his silk-screened message onto the unopened cylinder of locally bottled but internationally sold Coca-Cola. Literally 're-oriented', the product and its message were then reinserted into the circuits of commodity distribution – the cannibal commodity was thus sent forth to 'eat' parts of the ideology in which it was otherwise embalmed.

Perhaps it is not surprising that Brazilians such as Meireles and Oiticica should emerge as such important figures for post-modern artists and theorists, because they were forced to respond to the breakdown of a rationalized urban modernism that had tenuously ruled their country from the 1950s to the early 1970s (the utopian capital of Brasilia providing the public face of this modernity). Its intrusive politics made the US (and its commodities) an obvious target, and post-modernism emerged to codify and consolidate these critical approaches to hegemonic cultural forms.

Post-modernism had its origin as a theoretical term in early theories of modern history elaborated by Federigo de Onis and Arnold Toynbee (although a non-theoretical use of the term appeared as early as 1870 to distinguish post-impressionism from the 'modern' styles before it). Implicit in Onis's and Toynbee's writing was a view that industrialization had achieved a certain saturation and had entered a new phase, reflected in Daniel Bell's formulation of late-twentieth century United States as a post-industrial society. When literary theorist Frederic Jameson began using the term post-modernism, it became increasingly associated with post-colonial politics. As Jameson pointed out, the critique of 'master narratives' expressed by post-modernism, echoed the collapse of the major colonial outposts (in Franco-American Indochina, in French Algeria, and in scores of African republics). Arguably, it is the emergence of post-colonial cultures that have created the greatest rupture in the Western paradigm of modern art.

## VIRTUAL LOCATIONS

Clearly the Internet has provided a new cultural platform and a new forum for the circuits of exchange that have long fascinated modern artists. Crippled by the 'digital divide', the Web's ideology of interactivity and universality has not yet been achieved. But there is surprising resonance between the seeming breakdown of Cold War boundaries in geopolitics (even if that breakdown has produced a myriad of other microborders), and the geocultural whirl of art festivals, biennials, and feverish web-based activity. There is, on the one hand, a distinct air of utopian possibility for the localized producers of visual culture and a sense that if their information is sufficiently compelling it may instantaneously find its way to billions of viewers via the Web. On the other hand, the empowered, moneyed elite that still dominates the market for art and its information continue to seek the 'exotic', which is still constructed in terms of the foreign, the distantly local, the (other-) national. Visiting a website is only part of a global art world experience, which increasingly requires travelling to Guadalajara or Singapore, Sydney or Seoul. This path to 'acquire' worldly experience, to capture that sense of an authentic Other outside modernism's reach, has always mobilized the restless and acquisitive culture of modern art.

Artists, in their dealings with new media, have become aware of the demands of site-specificity in new and intriguing ways. Perry Hoberman, a media artist who produces CD-ROMs as well as interactive electronic installations, has a mailing address in New York, but his correspondence rarely comes from that city. He is more likely to be in Espoo (Finland), Tokyo (Japan), Hull (England), Karlsruhe (Germany) or Barcelona (Spain), tweaking an installation's hardware, software, and sculptural components, and trying to find local technicians and helpers to keep it going. The commissioners of his works seek to place themselves in a vibrant electronic community modelled on internationalism, but sense a new transnational identity in the making. Like the 'global village' envisioned by 1960s media guru Marshall McLuhan, venues for electronic art have more in common with each other than with the local, business, or governmental communities that fund them.

In Hoberman's 1998 installation *El Ball del Fanalet* (*Lightpool*), for example, the artist arrived with little more than a laptop, intending to work with local artists and computer scientists on a site-specific installation commissioned by the Fundaciò Joan Mirò. He knew he wanted to integrate music, a computer programme for sensing motion via infrared signals, and a visual 'virtual ground-plane' with which visitors could interact. The final concept and title for the piece came from a local Catalan tradition: a dance competition (the 'ball del fanalet'), in which couples waltz holding tiny coloured lanterns. The participants remain on the dance floor until the candles in their lanterns go out, and the prize goes to the last couple dancing. Hoberman undoubtedly imagined that a local reference such as this would charm his Spanish audience and gently invite them into an encounter with his work. Before this could happen, however, his hosts experienced acute anxiety – would the piece be perceived as supporting Catalan nationalism, hence inflaming the politics of contemporary Spain? (The flashy multinational venture of the Guggenheim Museum in Bilbao had already aggravated the testy Basque politics of the North.) Hoberman's patrons sought, in short, a link with global, transnational, electronic world culture, and they were unsettled when their artist of choice insisted on weaving the local into what he called his 'sensate environment' of dancing creatures and coloured lights.[96]

As in all the international biennials that have proliferated since the end of the Cold War, there is profound tension between the semiotics of the local and the yearning to take flight and escape into the global. This is the most recent manifestation of the dynamics between nationalism and internationalism in modern art – except the 'local' of post-modern art practice is more likely to be sought at the scale of minority urban communities rather than enormous federated states, and the 'global' is staged positively as a productive fiction, or negatively as merely the latest guise of commodity capital. Increasingly, the most successful artists of the twenty-first century are those who navigate and problematize these borders aggressively, employing deeply layered references that can be interpreted one way in their countries of origin, and a different way altogether in the nomadic world of the biennial and the travelling exhibition.

To take one example: the Chinese artist Xu Bing (now working in New York) was steeped in the rarefied, literati world of calligraphy as a young man. His most extraordinary installation to date is the 1995 *Book from the Sky* (also translated as 'Book of Heaven'), which refers to the Asian culture of calligraphy and fills an enormous space with books and unfurled paper printed with hand-carved ideograms in traditional woodblock forms. Viewers unfamiliar with Chinese marvel at this display of erudition – the stacks of hand-printed books and scrolls, which evoke so many of the ancient Chinese triumphs (e.g. the invention of paper, the ideogram, and the woodblock). The experience for the Chinese reader is quite different. Drawn into the texts, which fail to give way to meaningful words and sentences, the 'native' fails utterly to make sense of these impressive, well-formed characters. The fake ideograms are brilliantly done, requiring more erudition than if they were real (to avoid signifying anything, yet mimicking signification so perfectly, is an unparalleled feat in a language of more than 5,000 characters composed of a limited number of 'brushstrokes'). The post-modern concept of 'double-coding' operates here with a vengeance – native literates, and foreign illiterates, have incommensurable experiences of the same piece.

Wenda Gu, who announced his ambition in 1987 to 'transcend the East and West',[97] works with the same conflicted internationalism as Xu Bing. Gu's installations of ideograms and alphabetic sentences in his United Nations Series, which has been ongoing since 1993, are made of translucent gossamer screens in which apparently legible letters and characters are woven with human hair. Western viewers seek recognizable words among the texts, where the proliferation of cursive Arabic writing and Eastern ideogrammatic systems highlight the relative insignificance of the Roman alphabet when compared with other languages of the world. Even where Roman characters appear, the alphabet fails to form words (at least for the reader limited to English, German, and a few Romance languages). Gu and Bing, both included in recent exhibitions that speculate about the drive toward a 'transnational modernity', stubbornly materialize the *texture* of untranslatable locality to demonstrate the stubbornly non-universal aspects of the

world. Invoking Babel just as Tatlin had at the dawn of the last revolutionary century, these artists operate in the transnational art world by calling attention to blindness and the failure to communicate across linguistic and cultural boundaries. Gu adds the simultaneously touching and somehow forbidden dimension of *hair*, 'harvested' from barber shop floors in the places hosting his installations. The translucent scrims of 'organic' language speak only of an essential grounding in the body – a ground that language pretends to transcend, but may only in the end instantiate. These post-modern artists, then, acknowledge the distance of the 'other', but ensure that the operation of 'othering' occurs on both sides of a shifting divide.

There are many paradoxes in this performance or invocation of the 'other' and its imbrication in the nation, as this essay has investigated. Like a hydra, engagements with the 'other' form many heads that loom throughout the history of modernism. To enumerate them is to summarize the arguments of this text: (1) internationalism is condemned to rewrite (and so reinscribe) nationalism and nation, defining Others as *not* international, but local (corollary: to engage the other nation is to discover one's own nationality, and simultaneously to hybridize it); (2) modernist primitivism constructs its others from substrates that are often already modern, as the sophisticated sculptural forms of African masks already suggested; as John Clark notes, the relativizing of one's own history that constitutes an apprehension of the modern can be found in most 'primitive' but colonized cultures; (3) the success of modernist objects in communicating across national boundaries is often purchased, paradoxically, by embedding them deeper in a nativist discourse (this was the case with *Guernica*, which succeeded in representing a nativist 'Spain' to an audience of international Republican sympathizers); (4) the globalism of commodity culture functions in specifically local ways (as seen with *Coca-Cola Plan* and its Italian collector, as well as Brazilian conceptualists' understanding of their local theoretical framework); (5) the global character of the World Wide Web will change the discursive structures of the art world, but probably not the material status of local artistic 'capital' (as the insistent proliferation of national 'biennials' suggests); (6) the unending dream of internationalism (now 'transnationalism' or 'global culture') creates new vocabularies and institutions for shared discourses (the travelling exhibition, the biennial, the post-modern, the post-colonial, the post-oriental), but those discourses are always inflected and understood from within the specific situations and subjects of local culture.

Although we have moved from modernism to post-modernism, there is no escaping paradox. Nation lurks deep within international aspirations, and the global hovers phantasmagorically above the local site where art is viewed. Post-modernism merely continues the modernist antinomies with which we began. Perhaps the most intriguing development is the hybrid and *antropofagist* relationships in art of the new millennium – art seeks to devour its others in order to transform. We must wait until deep into the new millennium before we can evaluate the results of this molecular exchange. What is certain is that artists will be among the first to experience it.

## NOTES

1. Page 16 of sketchbook 14 in W. S. Rubin et al., *Les Demoiselles d'Avignon*, New York, 1994, p. 295.
2. See C. Lodder *Russian Constructivism*, New Haven, CT, 1983, p. 268.
3. Tatlin, 'The Work Ahead of Us' (1920), in J. Bowlt (ed. and trans.), *Russian Art of the Avant-Garde, Theory and Criticism 1902–1934*, 1988, p. 207.
4. C. Lodder, op. cit., p. 8.
5. V. Markov (pseud. for Waldemars Matveys) (1914), in Lodder, op. cit., p. 13.
6. Malevich, quoted in Bowlt, op. cit., p. xxxiii.
7. V. Mayakovskii, 'Art of the Commune' (1918), in Lodder, op. cit., p. 48.
8. *LEF*, 'Declaration: Comrades, Organizers of Life!' (1923), in Bowlt, op. cit., p. 199–202. Bold emphasis added.
9. V. Mayakovsky, 'Parizh' (1923), in G. H. Roman, 'Tatlin's Tower: Revolutionary Symbol and Aesthetic', in G. H. Roman and V. Hagelstein Marquardt (eds), *The Avant-Garde Frontier, Russia Meets the West, 1910-1930*, Gainesville, FL, 1992, p. 53; 'Mayakovskii i Tatlin', in Lodder, op. cit., p. 61.
10. Tatlin (1918), in Lodder, op. cit., p. 55.
11. N. Punin (1922), in Lodder, op. cit., p. 61.
12. V. Shklovsky, in Roman, op. cit., p. 54.
13. A. Lunacharsky (1927), in Roman, op. cit., p. 55.
14. V. Mayakovsky (1925), in Roman, op. cit., p. 53. Emphasis added.
15. A. Macke, 'Masks' (1912), in C. Harrison and P. Wood, *Art in Theory 1900-1990: An Anthology of Changing Ideas*, Oxford, 1992, pp. 100–1.
16. E. Nolde, 'On Primitive Art' (1912), in Harrison and Wood, op. cit., p. 102.
17. F. Picabia (1915), in C. A. Jones, 'The Sex of the Machine: Mechanomorphic Art, New Women, and Francis Picabia's Neurasthenic Cure', in C. A. Jones and P. Galison (eds), *Picturing Science, Producing Art*, New York, 1998, pp. 145–80.
18. F. T. Marinetti (1909), in Harrison and Wood, op. cit., p. 147–48.
19. Ibid.
20. U. Boccioni et al., 'Futurist Painting: Technical Manifesto' (1910), in Harrison and Wood, op. cit., p. 150.
21. See C. Tisdall and A. Bozzola, *Futurism*, London, 1978, pp. 182, 177.
22. See J. T. Schnapp, 'Politics and Poetics', in *Stanford Italian Review*, Vol. 5, No. 1, 1985, pp. 75–92.
23. See E. Braun, 'Speaking Volumes: Giorgio Morandi's Still Lives and the Cultural Politics of Strapaese', in *Modernism/Modernity*, Vol. 2, No. 3, 1995, p. 92.
24. Ernst (1951), in U. M. Schneede, *Max Ernst*, 1972, p. 16.
25. See W. A. Camfield, *Max Ernst, Dada and the Dawn of Surrealism*, Munich, Germany, 1993, p. 22
26. H. Arp (1939), in J. Russell, *Max Ernst Life and Work*, New York, 1967, p. 42.
27. A. Breton (1924), in A. Breton, *Manifestoes of Surrealism*, Ann Arbor, MI, 1969, p. 26.
28. Ibid., note to p. 27. Emphasis in the original.
29. See R. Golan, *Modernity and Nostalgia: Art and Politics in France between the Wars*, New Haven, CT, 1995.
30. Schneede, op. cit., fig. 26.
31. E. M. Legge, *Max Ernst: The Psychoanalytic Sources*, Ann Arbor, MI, 1989, pp. 52–53.

32.   Apollinaire's *L'Enchanteur pourrissant*, in Legge, op. cit., p. 52.

33.   Legge, op. cit., p. 56.

34.   *Der Elefant von Celebes. The Elephant from Celebes.* Hat hinten etwas gelebes – has sticky, yellow grease on his bottom.

35.   *Der Ventilator* (1919), cited in W. Spies, *Max Ernst Collages: The Invention of the Surrealist Universe*, London, 1991, p. 281.

36.   See Camfield, op. cit., p. 99.

37.   W. George (1931), in R. Golan, *Modernity and Nostalgia: Art and Politics in France between the Wars*, New Haven, CT, 1995, p. 153.

38.   E. Oppler, *Picasso's Guernica: Illustrations, Introductory Essay, Documents, Poetry, Criticism, Analysis*, New York, 1988, pp. 58–59.

39.   F. von Richthofen (1937), Goering testimony (1946), in Oppler, op. cit., p. 166.

40.   A. de Onaindía (1937), in Oppler, op. cit., p. 164.

41.   Oppler, op. cit., p. 57.

42.   Ibid., pp. 202–3.

43.   W. S. Rubin, *Dada and Surrealist Art*, New York, 1968, pp. 290–309.

44.   See *Head of a Bull with Human Face*, 10 May 1937, and *Bull with Human Face*, 11 May 1937, in Oppler, op. cit., figs. 21, 23.

45.   Cited by M. Aub (1937), in Oppler, op. cit., p. 204.

46.   Picasso, in Oppler, op. cit., p. 102–03

47.   Picasso (1947), in Oppler, op. cit., p. 102. Emphasis added.

48.   'Wholly inadequate' in Oppler, op. cit., p. 74; Le Corbusier [Jean Jeanneret], 1937, and German pamphlet in H. B. Chipp, *Picasso's Guernica: History, Transformations, Meanings*, London, 1988, p. 152.

49.   V. Marrero (1956), in Oppler, op. cit., p. 173.

50.   Minister of Culture Cavero, in H. B. Chipp, op. cit., p. 190.

51.   G. Panza, in C. Knight et al., *Art of the Fifties, Sixties and Seventies: The Panza Collection*, 1999, pp. 20–21.

52.   G. Bataille (1929), in G. Bataille, *Visions of Excess: Selected Writings, 1927–1939*, Minneapolis, MN, 1985, p. 31.

53.   A. Tàpies, in C. Giménez, *Tàpies*, New York, 1995, p. 47.

54.   Typescript manuscript in Tàpies correspondence, Getty Research Institute Special Collections, Panza Papers, Box 148, Folder 15.

55.   Tàpies, in Giménez, op. cit., p. 46.

56.   Y. Jiro (1967), in P. Schimmel et al., *Out of Actions: Between Performance and the Object, 1949-1979*, Los Angeles and New York, 1998, pp. 121.

57.   H. Ichiro (1979), in Schimmel et al., op. cit., p. 126.

58.   S. Kazuo (1955), in A. Munroe, *Japanese Art after 1945: Scream Against the Sky*, New York, 1994, p. 373.

59.   C. Jung (1930), in M. Leja, *Reframing Abstract Expressionism*, New Haven, CT, 1993, p. 104.

60.   B. Newman, *Selected Writings and Interviews*, Berkeley/ Los Angeles, CA, 1992, pp. 107–8.

61.   See Newman and others in 'What is Sublime' (1948) in A. E. Gibson, *Issues in Abstract Expressionism: The Artist-run Periodicals*, Ann Arbor and London, 1990, pp. 159–69.

62.   Newman (1948), in Gibson, op. cit., pp. 173, 187.

63.   J. Pollock (1947), in C. A. Jones, *Machine in the Studio: Constructing the Post-war American Artist*, Chicago, IL, 1996, p. 47.

64.   H. Rosenberg (1952), in H. Rosenberg, *The Tradition of the New*, Chicago, IL, 1959, p. 25.

65.   A. Kaprow, 'The Legacy of Jackson Pollock', in *Art News*, No. 57, 1958, p. 56.

66.   B. Buchloh, in A. Alberro and B. Stimson, *Conceptual Art: A Critical Anthology*, Cambridge, MA, 1999, pp. 514–37; see also C. A. Jones, *Eyesight Alone: Clement Greenberg's Modernism and the Bureaucratization of the Senses*, Chicago, IL, 2004.

67.   This terminology, although perhaps unfamiliar, is necessary. Once the non-technological cultural products of 'the West' were adopted, adapted, and transformed outside 'the West', the location of their geographical origin no longer constituted a privileged civilizational autonomy. One pernicious legacy of direct colonialism is that the cultural products transferred to the world from 'the West' are somehow always to be denied their *authenticity* to those who adopted them under its duress in places not in 'the West', at least seen from the position which I shall now locate in *Euramerica* or characterize as *Euramerican*. For fuller exemplification, see my *Modern Asian Art*, Sydney and Honolulu, 1998.

68.   See J.-H. Martin (ed.), *Les magiciens de la terre*, Paris, 1989.

69.   See, e.g., Gao Minglu (ed.), *Inside Out, New Chinese Art*, Berkeley, 1998, for country focus; for area-specific shows see A. Poshyananda et al., *Traditions/Tensions: Contemporary Art In Asia*, New York and Sydney, 1996; for exhibitions in which country or area foci are prominent see Hou Hanru and H. U. Olbrich, *Cities on the Move*, Ostfildern-Ruit, 1997.

70.   For early Rimzon material see A. Dube, catalogue essay for *Seven Young Sculptors*, New Delhi, 1985. See also V. Lynn, 'The Art of N. N. Rimzon', *Art & Asia Pacific*, Vol. 3, No. 2, 1996.

71.   Art historically speaking, modernity, modernism, and postmodernism do not form a series of clear-cut tripartite stages, but tend to overlap, particularly if there is a relative freedom to eclectically modify styles whose sources do not yet operate a bounding hegemony, such as the 'syncretic' architecture of early Meiji Japan.

72.   Darwin's position was as follows: 'Thus modern forms ought, on the theory of natural selection, to stand higher than ancient forms. Is this the case? It seems that this answer must be admitted as true, though difficult of proof', p. 174. in C. Darwin, *The Illustrated Origin of Species*, (abridged and introduced by R. Leakey from 6th edition of 1872, including comments which update Darwin's theories or his evidence), London, 1979. For S. J. Gould, see his *Wonderful Life: The Burgess Shale and the Nature of History*, London, 1989, p. 47: 'The maximum range of anatomical possibilities arises with the first rush of diversification. Later history is a tale of restriction, as most of these early experiments succumb and life settles down to generating endless variants upon a few surviving models'.

73.   Since it seems so directly indicative of the problems raised here, please allow a somewhat lengthy citation from Bakhtin's 'Discourse in the Novel', found in M. M. Bakhtin, *The Dialogic Imagination*, (trans. C. Emerson and M. Holquist), Austin, TX, 1981, p. 284–5: 'But internal dialogization can become such a crucial force for creating form only where individual differences and contradictions are enriched by social heteroglossia, where dialogic reverberations *do not sound in the semantic heights* of the discourse (as happens in rhetorical genres) *but penetrate the deep strata of discourse*, dialogize language itself and the world view a particular language has' [my italics].

74. For a discussion of 'double othering', see J. Clark, 'Yôga in Japan: Model or Exception? Modernity in Japanese Art, 1850s–1940s: an international comparison', *Art History*, Vol. 18, No. 2, June 1995, pp. 253–85. For the relativization of 'othering', see J. Clark, 'Gendai Ajia no Bijutsu gensetsu ni okeru "Taka' ('Othering in Modern Asian Art Discourses') translated into Japanese in a volume edited by Shimamoto Kan, from a Tezukayama Gakuin workshop paper of 1996.

75. See Chapter 2 on 'Prehistories' in J. Clark, *Modern Asian Art*, Sydney, 1998.

76. See J. Clark, 'Histories in the Modern', in G. Murray et al. (eds), *Reckoning with the Past: Contemporary Chinese Painting*, Edinburgh, 1996, pp. 17–20.

77. See, for example, the discussion of 'Chairman Mao goes to Anyuan' in J. Andrews, *Painters and Politics in the People's Republic of China: 1949–1979*, Berkeley, 1994, pp. 338–42.

78. For a feminist understanding of Ravi Varma see G. Kapur, 'Ravi Varma's Unframed Allegory' in R. C. Sharma (ed.), *Raja Ravi Varma: New Perspectives*, New Delhi, 1993.

79. See his work 'Duta Indi Bala' [Land not bullets] in the catalogue of the *First Asia-Pacific Biennale*, Brisbane, 1993, p. 31.

80. Among Geeta Kapur's important earlier writings are *Pictorial Space: A Point of View on Contemporary Indian Art*, New Delhi, 1977; *Contemporary Indian Artists*, New Delhi, 1978 [Souza, Kumar, Padamsee, Husain, Khakhar, Swaminathan]; and *Place for People*, [text for exhibition], Bombay and New Delhi, 1981. Li Xianting's activities may be glimpsed in English through his historical essay in V. C. Doran (ed.), *China's New Art post-1989*, Hong Kong, 1993, and the essay 'The Imprisoned Heart', *Art & Asia Pacific*, Vol. 1, No. 2, 1994. For Nakahara Yûsuke's position, see N. Yûsuke et al., *Europalia 89: Japan in Belgium*, Gent, 1989.

81. See Nanjô Fumio and D. Friis-Hansen, *Transculture*, Tôkyô, 1995. Nanjô was very active in the 1980s in introducing Japanese contempoary art abroad. See in particular, K. Halbreich et al., *Against Nature: Japanese Art in the 1980s*, New York, 1981; Kondô Yukio et al., *Japansicher Kunst der Achziger Jahre*, for the Frankfurter Kunstverein, 1990. Hou Hanru was the Chinese adviser for *Les magiciens de la terre* and has since been active as a curator of modern Chinese art in Europe working from Paris. See his essays 'Departure Lounge Art', *Art & Asia Pacific*, Vol. 1, No. 2, 1994; 'Beyond the Cynical: China avant-garde in the 1990s', *Art & Asia-Pacific*, Vol. 3, No. 1, 1996; 'Towards an "Un-Unofficial Art": De-ideologicalisation of China's Contemporary Art in the 1990s', *Third Text*, No. 34, Spring 1996; 'Entropy; Chinese Artists, Western Art Institutions: A New Internationalism', in J. Fisher (ed.), *Global Visions: Towards a new internationalism in the Visual Arts*, London, 1994; 'De "décrire la réalitié" au "théâtre du monde": L'art Chinois depuis 1979' (trans. J. Lacoste), in H. Belleter (ed.), *Face à l'Histoire*, Paris, 1996. See also *Cities on the Move*, note 5, and his conversation with Gao Minglu in *Inside Out*, op. cit.

82. On 'doorkeeping' see J. Clark, 'Art and its "others" – recent Australian-Asian visual exchanges', M. Dever (ed.), *Australia and Asia: Cultural Transactions*, Surrey, 1997, and also Chapter 11 of my *Modern Asian Art*.

83. Thus catalogues like *Cities on the Move*, in a tendency followed by the recent catalogue *Cream*, G. Williams (ed.), London, 1998 (which declares itself to be 'a portable exhibition in a book'), increasingly resemble telephone books where the artists' works become a kind of conceptual address and the name of the artist a fantastic, unfathomable number.

84. M. Schapiro (1957), in M. Schapiro, *Modern Art: Nineteenth and Twentieth Centuries, Selected Papers*, 1978, p. 218.

85. E. Loran (1963), in C. A. Jones et al., *Panza: Legacy of a Collection*, 1999, p. 43.

86. Warhol interviewed by G. Swenson, 'What is Pop Art?', *Art News* Vol. 52, No. 7 (November 1963), p. 26, and A. Warhol, *The Philosophy of Andy Warhol: From A to B and Back Again*, 1975, pp. 100–101.

87. Cited in S. Stich, *Made in U.S.A: An Americanization of Modern Art*, Berkeley and Los Angeles, CA, 1987, p. 93.

88. D. Sylvester (1964), in C. A. Jones et al., op. cit., p. 23.

89. Panza in C. Knight, *Art of the Fifties, Sixties and Seventies: The Panza Collection*, 1986, p. 41.

90. A. Perilli (1957), in C. A. Jones et al., op. cit., p. 47.

91. Panza (1985), in C. A. Jones et al., op. cit., p. 25.

92. R. Smithson (1969), in J. Flam (ed.), *Robert Smithson: The Collected Writings*, Berkeley and Los Angeles, CA, 1996, pp. 119–20.

93. Ibid., p. 132.

94. Ibid., pp. 131–33.

95. H. Oiticica (ca. 1970), in H. Oiticica et al., *Hélio Oiticica*, Rotterdam and Minneapolis, MN, 1992, p. 93.

96. P. Hoberman, talk at Center for Advanced Visual Studies, MIT, 4 November 1999.

97. Wenda Gu (1987), in M. Gao, op. cit., p. 40.

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<h1 style="text-align:center">27</h1>

# PHYSICAL CULTURE AND SPORT

*Clarisse Pereira-Palhinhas*

## INTRODUCTION

Physical culture, physical education, physical exercise, physical and sporting activities are all words that express pursuits that are very closely allied, not to say inextricably linked. Jean-Marie Brohm writes 'the first difficulty that arises in studying sport is pinning down the nature of the subject. Just what is sport?',[1] and he observes that the usual meaning lends itself to a fairly broad definition.

The increase in the number of terms associated with physical and sporting activities is the result of the frequently complex progress and development of these activities throughout the cultural history of humanity. Being an integral part of social life, they reflect society as a whole and play a part in its change and transformation. Their significance varies from one era or society to another. The essence and values that they convey depend on ideological, philosophical, anthropological, economic and technical implications, which vary from one historical period or cultural environment to another. According to some historians, physical activities and sports originated in the distant past, and were linked to activities needed for survival (hunting and battle). German sports historian Gerhard Lukas, for example, saw man essentially as a worker and therefore believed that 'throwing the javelin' was the first sport.

Because the history of physical culture determines that of physical education, it cannot be separated from the history of education, which is directly linked to philosophical and pedagogical presuppositions. It seems that physical culture has always been an integral part of the life of different peoples. Robert Parienté tells us: 'The instinct for sport is no doubt as old as man's first leisure activities and the origin of competition is lost in the mists of time. Rivalry between clans or tribes probably provided the original context enabling a form of physical activity foreshadowing sport to arise. Sport appeared as soon as the idea of play entered into daily life and it gradually freed itself from material constraints and difficulties ... Thousands of years actually had to go by before this state of limbo was left behind and the efforts that were wholly devoted to military discipline, as practised by the Egyptians and Chinese, developed into participation in an autonomous and individualized sporting activity ... the oldest evidence available to archaeologists, apart from the Lascaux hunters' cave paintings, dates back to 3500 BC: the

Nile Valley bas-reliefs depicting man in training – running, jumping, swimming and horse-riding.'[2]

Many authors concur with Robert Parienté in believing that sport originated in antiquity and derived from rituals – chiefly funerary rituals, but also those used in initiation and hierogamic ceremonies. Bernard Jeu, author of several books on the nature of sport, believes that from the earliest days of society, sport was linked to tribal life which is thought to have exercised cultural control by the group over the three major events of coming of age, marriage and death. 'For obvious socio-economic reasons, physical values then become social values. For no less obvious reasons – we are talking about undifferentiated societies with a universal culture – social values are sacred values.'[3]

Taking ancient games, including Homeric sports, as their starting point, two eminent authors have dealt brilliantly with the notion of play and sport. Johan Huizinga in his book *Homo ludens*,[4] and Roger Caillois in *Man, play and games*,[5] put forward ideas and analyses for understanding the phenomenon of sport. The two authors show how culture and play are linked. Caillois maintains that modern civilization arose with the advent of *agon* (competition), and that ordered competition established meritocracy. He also maintains that, of the early civilizations based on the dual concept 'mimicry-ilinx' (simulation and vertigo), Ancient Greece made the transition to become a civilization based on the pairing of *agon-alea* (competition and chance). Huizinga notes that there is a link between *agon* and *agonia*, which initially meant 'competition' and later acquired the additional meaning 'struggle of the soul' or 'anguish', an important aspect of sport, given the uncertainty of victory. Sport is said to help reduce the anguish inspired by everyday existence and questioning about the purpose of life and the meaning of death. Authors such as G. R. Luschen and P. Seppanen also consider that sport can reduce anguish in our modern societies as it did in ancient society.

According to Raymond Thomas, 'In ancient Greece, many temples specialized in divination. Oracles were consulted. People sought to know the future and so reduce the role of chance.... In modern times, competitions are still associated with gambling (horse racing and football pools). The most popular sports are those that leave room for chance, football in particular. On the other hand, the athlete tries to reduce the role of chance in his performance by

training.'[6] Worry over the chance effects of imponderables in any sporting event and fear of the unpredictable are all to be found in different cultures.

In the view of Bernard Jeu, author of *La vraie nature du sport*, there is a line of continuity running through pagan ceremonies (worship of the Greek, Inca or Egyptian gods, for example), the popular games derived from them and the practice of modern sports. Many of the rural games played in medieval Europe are regarded as relics of pagan ceremonies, and games such as *soule* or *choule* (in France) and *calcio* in Italy are thought to be the forerunners of rugby and football. Allen Guttmann, in his book *From Ritual to Record*, maintains that sport, beginning as a ritual in ancient societies, became a competitive system with the advent of modern societies based on efficiency.

There would thus appear to be some kinship between ancient and modern sport, a line of continuity, a thread running through different ages. James Riordan, analysing sport in the countries of the former Soviet bloc, makes the following comment: 'Sport has the same function as religious ritual in that it serves to develop what Durkheim calls cohesion, solidarity, integration, discipline and emotional euphoria.'[7]

For other theorists, this continuity is now being broken by modern sport, which they consider to be linked to the industrial system and the laws governing it; in that context it emerges as a category of its own. P. Laguillaumie, for example, writes: 'Not only is the emergence of modern sport – i.e. sport practised in certain types of organized situation, radically different from those of antiquity – a historical phenomenon dating from the advent of bourgeois industrial mechanization during the ascendant phase of capitalism, not only did the global development of sport follow the global development of capitalism, but also, and most important of all, its internal organization, structures, forms and content are now essentially bourgeois.'[8] They feel that the principle of productivity is triumphant in modern sport; measurement, quantification, setting of new records, speed are its basic characteristics, mirroring those of the industrial system that produced it.

On the other hand, some modern sports specialists refuse to see anything more than a trans-historic phenomenon here; in their view, physical exercise has always existed and they feel that modern sport is no different from what went before.

Allen Guttmann, however, spells out seven specific characteristics of sport in modern society, as compared with sport in the ancient world: (a) secularism: sport is no longer associated with religious ceremonies; (b) equality of opportunity: games are open to everybody; (c) specialization of roles; (d) rationalization: sport is subject to strict rules; (e) bureaucratization; (f) quantification: modern sporting performance is measured; and (g) setting of new records: there are winners, a new record is set.

## ORIGINS OF PHYSICAL ACTIVITIES FROM ANCIENT TIMES TO THE NINETEENTH AND TWENTIETH CENTURIES

### Ancient Greece

The American school of cultural anthropology sees culture as a pattern, which is impressed upon the mentality of every person within a given cultural sphere through education and learning. There is therefore a 'cultural basis for personality' or 'basic personality', which is the distinctive psychological configuration of the members of a particular society, manifesting itself in a certain life style. Because physical culture is an integral part of the general culture of any given society, its specific features and mode of development differ from one period or people to another.

Education is defined as 'a set of measures intended to develop the physical, intellectual and moral faculties of the child, adolescent and/or adult, in order to prepare them for social life ... Educational institutions and practice are closely related to social systems, their role being to hand down a culture and a body of knowledge and also to provide for social and economic development'.[9]

Not until we come to Ancient Greek civilization do we find the first concrete and theoretical evidence of a genuine educational system, one in which a pedagogical and methodical approach was adopted. Ancient Greece attached great importance to a form of education that inculcated the ideals of society into the child: discipline and strength in warlike Sparta, a sense of beauty and rhetorical style required by the citizen in the democratic city of Athens.

In the fourth century BC, the first educational institutions were established: *palestrae* and *gymnasia*, where the adolescent trained his mind and body. He subsequently undertook ephebic service, i.e. military service and civic education. In the *Iliad* and the *Odyssey*, the epic poet Homer describes the martial and athletic feats of Ulysses with many interesting details, and Book XXIII of the *Iliad* depicts the games organized for the funeral of Patroclus. 'The events include chariot racing, boxing, pankration, running, fencing, throwing the discus and archery. They clearly foreshadow the programme of Olympic events that developed from the first Olympiad onwards'.[10] The first Olympic Games were held in 776 BC, when the name of the Greek athlete Koroebos was carved in stone after he had won the race from the stadium to Olympia; 776 BC is therefore the official date for the birth of sport in Greece.

The word *athlete* comes from *athlon*, a Greek word meaning both 'contest' and 'what is to be won in the contest', the original prize being a crown of wild olive leaves.[11] It should be noted, however, that the sports *athlon* originated in the Mediterranean world around the sixteenth century BC, and that the Cretans had been enjoying running, *pankration* and bullfighting ever since that time. The bas-reliefs of Knossos and the sculpted vases of Aghia Triada show many details of athletic life in Crete.[12] Sport contests in Olympia were both religious and patriotic ceremonies. They were dedicated to the gods Zeus, Poseidon, Hercules and Apollo, and to the goddess Hera. Bertrand During explains: 'The Greeks did not speak of "games" but of "things Olympian", which touch upon the sacred and illustrate the seriousness of competitions that are all about coming closer to the perfection of the gods. The central value is that of courage, which enables competitors to attain the heroic: if we cannot be eternal we can still be glorious.'[13]

### The Roman Empire and the Middle Ages

In the Roman Empire, where all education had initially been provided by the family, the Greek model was adopted for the training of the mind: reading, writing, arithmetic,

Greek and Latin literature, and initiation in the art of public speaking. But physical education was somewhat neglected since the Romans preferred the barbaric games of the circuses where they cheered on the slaves as they slaughtered each other. The Olympic Games were regarded as a source of paganism and were abolished by Emperor Theodosius, a Christian convert. The new theocracy was therefore one reason why the Olympic Games disappeared for many centuries.

Medieval Europe, the successor to the Roman Empire, perpetuated the old educational model while Christianizing its content, following the example of Saint Augustine, and providing a systematic framework for the liberal arts of Hellenistic origin.

But, 'paradoxically, it was Christianity which, having dug the grave of ancient sport, was to invent modern sport … Indeed, the Middle Ages provided an essential boost … Admittedly, the great concern of the Middle Ages was not so much to be learned as to be strong. The first priority was self-defence; people died young and were less attached to life than they are today. They risked their lives for pleasure, for what was really at stake at tournaments were the lives of the competitors. Kings and popes consequently issued numerous decrees forbidding jousting on account of the pointless deaths it caused … Games were like war and war was like a game. Jousting and fencing were practised on a very wide scale by the nobility'.[14] From the eleventh century onwards, the passion for violent games and exercises throughout medieval Europe lasted a very long time. The lance, the spear, the mace, the bow, the crossbow and the halberd were all used in bloody contests. The numerous duels are described in epic narratives. In France in the eleventh century, the game of *soule*, also known as *choule*, became immensely popular. This was played with a ball made of wood or leather, filled with straw or bran or blown up with air, and was the forerunner of football and rugby. *Soule* – a people's game, although it was also very popular with the clergy and even with nobles and kings – pitted entire villages against each other for several days amid scenes of extreme violence. Many young people died during the game since no holds were barred. '*Soule* was thus the dominant sport in twelfth-century France. It was imported from the continent to England, where it was soon to become known as football.'[15] 'The Middle Ages saw the development of other forerunners of modern games, such as the *jeu de paume*, whose relation to tennis is obvious in that it called for much the same sort of space. Paris had 250 *jeu de paume* courts at the end of the sixteenth century. *Calcio* was a Florentine ball game (*calcio florentino*).'[16] Hence the name of the Italian football federation, founded in 1898: *Federazione Italiana Gioco Calcio* or *Federcalcio*. The transformation of traditional games into modern sports highlights the close link between the notion of play and that of sport. 'The word "sport" is thought to be derived from the old French word "desport" (disport or entertainment) and we know that in Rabelais the verb "desporter" means to disport or enjoy oneself … The word "sport" appears in French in 1820, and refers initially to such activities as racing and betting, fishing, hunting, polo, fencing, golf, cricket, boating, i.e. the many fashionable leisure pursuits practised at seaside resorts, many of them in imitation of Great Britain.'[17] Hence the widely held view, propounded notably by the sociologist Norbert Elias, that sport was born in the United Kingdom, the result of the Industrial Revolution and urbanization,

and part of the long process of cultivating civilized behaviour and controlling violence. However, the dispute between the French and the English over the invention of the word 'sport' continues to this day. Another tradition looks to the English word 'sport', in the sense of hunting, which dates back to the sixteenth century. The word in its modern sense was only recognized by the Académie française in 1878.

Michel Bouet describes the end of the medieval system of martial games as follows: 'However, what was lost in this way were the knightly martial exercises. The popular games wrestling, *soule* and *crosse* were still played, particularly by the peasantry. And in the expanding towns, the need to train citizens for defence gave rise to some form of archery militia. In addition, the *jeu de paume* was taken up by a large number of city dwellers, as it provided the exercise they were beginning to feel the need for and could be practised within a restricted space.'[18]

## The sixteenth to the eighteenth century and the schools of gymnastics

The period from the sixteenth to the eighteenth centuries includes the Renaissance, when people joined with Montaigne in stressing the necessary relationship between training and pragmatism, in which travel was a way of educating. With the advent of the Jesuit colleges came the first educational 'methods'. In Reformation countries, the availability of the Bible in the vernacular meant that the lower strata of society could be educated. In Catholic countries, the mission to educate the Christian people was taken up by John Baptist de la Salle and the Brothers of the Christian Schools with the establishment of free elementary schools (*petites écoles*).

In Great Britain, the Protestant schools came to advocate a form of education designed to produce the 'muscular Christian', one who was strong and in good physical health. This trend continued to develop right up to the nineteenth century, when sporting practices born in British schools spread to other countries. The eighteenth century, the age of the Enlightenment, saw a systematic review of education, typified by Jean-Jacques Rousseau's *Emile*, which extolled the merits of a healthy childhood and adolescence resulting from physical exercise in the open air. Meanwhile, in continental Europe, increasing emphasis was being given to the role of the school in developing the physical abilities of future citizens. Physical exercise within the restricted and often closed confines of the school encouraged the institutionalization of 'gymnastics'. The European armies considered gymnastics as an essential part of the training of the individual, who was regarded first and foremost as a citizen, ready to defend his homeland, and the official status they gave to gymnastics was in marked contrast to the liberal, recreational and social character of British sport. The reaction to the French Revolution and the Napoleonic Empire gave a particular boost to gymnastics in Germany. In 1793, Johann GutsMuth wrote the first treatise on gymnastics for young people. In 1811, Friedrich Ludwig Jahn founded a gymnastics club, the *Turnplatz*, with a view to combating the 'degeneration of the race' and developing a sense of patriotism.

There are many reasons why gymnastics found it difficult to break free from the context of conscription, given that the social climate in continental Europe was decidedly nationalistic

and militaristic. At that time, the culture of gymnastics was dominated by two major schools of thought:

1. Swedish Gymnastics devised by Per Henrick Ling (1776–1839), which were to contribute to the simultaneous development of mind and body and had four objectives: educational, military, medical and aesthetic.
2. German Gymnastics passed down from Jahn, which placed great emphasis on the use of equipment.

The debate over the relative merits of Swedish and German gymnastics was to continue until 1920.

In France, gymnastics took a particular turn owing to the experiments of Colonel Francesco Amoros (a naturalized Frenchman of Spanish origin), who was regarded as a follower of Pestalozzi (a Swiss) and Jahn (a German). His keen interest in medicine and human mechanics led him to adopt scientific methods, including the physiological record cards of Dr Verdier and the dynamometer to measure muscular effort. He set up several gymnasiums, including the Grenelle 'gymnase normal' – civil and military – in 1819, which was over-equipped with apparatus. The French army adopted the Amoros method for the military gymnastics training school at Joinville-le-Pont, which was established in 1852. A decree of 1869 made gymnastics compulsory in schools and teacher training colleges. The 1902 military regulations introduced Swedish gymnastics into barracks. In this way the outlines of a standard and normative form of gymnastics were established in France, exemplified by school gymnastics which represented a harmonious synthesis of the Swedish and German methods.

### Great Britain and the sporting revolution of the nineteenth century

The nineteenth century saw the general democratization of education in Western Europe. It was the century in which, at widely differing dates from country to country, state education systems were introduced. In France, this democratization dates from Jules Ferry's law of 1882, which made education compulsory and free throughout the Republic. The rapid spread and democratization of sport throughout France then followed as a result of the massive increase in schooling and the rise in the number of associations. The British played an essential role in inventing modern sports, in making them known and getting them adopted in Western Europe, and in changing attitudes towards physical culture.

In Great Britain and the United States in the mid-nineteenth century, an entertainment industry grew up, offering spectator sports and new leisure activities open to everybody. A taste for holidays, travel, leisure pursuits and amateur sports developed.

'Between 1828 and 1842, the Headmaster of Rugby School, Thomas Arnold, shaped the minds of young Englishmen. His originality consisted in making sport an element in character formation: the pupil learned to appreciate the importance of self-discipline. Sport became a major plank in moral education and, closely associated with study, it rapidly became the cornerstone of all British education on which the power of the kingdom and the empire was largely based.'[19] In 1841, the Englishman Thomas Cook organized his first trip, and the Swiss author and cartoonist, Rudolph Töpffer, published his book

*Voyages en Zig-Zag.* 'School games are codified in English schools by teachers like Thomas Arnold: football, rugby, polo, boxing, swimming and athletics are the main ones listed in this way and rugby is, in the words of J.P. Bodis, the great educational sport of Great Britain.'[20] Legend has it that in 1823, a pupil at Rugby School, William Webb Ellis, pushed the ball into the opponent's goal with his hand and thus invented what was soon to be known as rugby football, after the name of the town where it originated.

In 1850, the public schools, the universities and large towns were equipped with gymnasiums. The first British sports federations were established: the Rugby Football Union (1871), the Scottish Football Union (1873), the Amateur Athletic Association (1880) and the Northern Rugby Union (1895). Other European countries decided to follow Great Britain's example and set up their own federations, and the Italian Football Federation or Federcalcio was set up in 1898, the Union des Sociétés Françaises de Course à Pied in 1870, and the Deutscher Fussball-Bund in 1900.

The English sporting vocabulary also gained ground: jockey, turf, pedigree, running footmen, riding-coat and sportsman (in the sense of horse-riding enthusiast). British engineers working on the construction of railway lines and commercial employees were responsible for founding the first sports clubs in Europe and on the route to India. They were established in Mauritius as early as 1812, and between 1855 and 1892 in Belgium, the Netherlands, France, Switzerland and Russia. The Juventus Club in Turin (Italy) was established in 1897. In France, the pupils at the Lycée Michelet in Vanves founded the Olympique in 1870, those of the Lycée Condorcet established the Racing Club in 1882, and those at the Lycée Saint-Louis founded Le Stade in the *Jardin des Tuileries* in 1883. Modern sport was now regarded as a means of instilling discipline and sound morals; it reflected a resolve to 'civilize' traditional games by imposing rules and regulations in an attempt to rechannel aggression and violence, bringing players together in federations and clubs, organizing regional and then international competitions and championships. The year 1885 saw the birth of professional football in England.

### Rise of American sports and birth of handball in Europe

The United States, a decolonized nation wishing to assert its individuality, created its own sports, such as American football and also baseball, which was to become the sport that symbolized the nation. In December 1891, James Naismith, a physical education teacher at the Young Men's Christian Association (YMCA) in Springfield, Massachusetts, invented basketball, an indoor ball game, to occupy students during the long winter months. The game rapidly spread to other countries via the YMCA's worldwide network, and young people were playing basketball as early as 1892 in Canada, 1893 in France, 1897 in Bohemia, 1904 in Turkey and 1905 in Russia. In the United States, the first professional basketball league was formed in 1949. The 'Dream Team', formed in 1992 with Michael Jordan as captain, comprised all the stars of American basketball and made a huge impact internationally.

At a YMCA event in 1895, the Reverend William G. Morgan, a former student of James Naismith and head of Physical Education at Holyoke College (Massachusetts),

demonstrated a ball game involving volleying a ball back and forth, which therefore took the name *volleyball*. Having spread through the YMCA network, volleyball became very successful in the United States and other countries in the Americas, such as Canada, Brazil and Cuba, and even as far afield as Asia, where it was taken up in China, Japan and India. These two ball games gained prominence in Europe during the First World War. In the course of the twentieth century, basketball and volleyball gradually spread all over the five continents. The FIBA (International Basketball Federation) and the FIVB (International Volleyball Federation) were established in 1932 and 1947 respectively.

Baseball and American football have not really caught on in other countries, apart from Cuba and Japan after 1945, following the spread of American culture to the Land of the Rising Sun. Baseball, which was often played in military camps during the American Civil War, 'became the national game because it perfectly mirrors the structure of American civilization; it is an outdoor sport in which performance can be measured.'[21]

Handball was invented in Czechoslovakia in 1892 by J. Klenker, who devised a ball game called Česka Hazena, similar to modern seven-a-side handball, but played in the open air. In Denmark, in 1898, H. Nielsen promoted seven-a-side handball, which was played indoors because of the severe cold. Germany developed an eleven-a-side version, modelled on rugby and football. In 1919, Karl Schllenz laid down rules: goal area barred to players other than goalkeeper; movement with the ball limited; and some contact authorized. Adopted as a complementary sport by basketball and athletics federations, handball's own amateur international federation was established in 1928 when the Olympic Games were held in Amsterdam. In 1946 the federation became the International Handball Federation and set up its headquarters in Stockholm.

## THE REVIVAL OF THE OLYMPIC GAMES

### Baron de Coubertin and internationalism in sport

At the end of the nineteenth century and in the twentieth century, sport in France and subsequently throughout the world was marked by the fascinating and passionate figure of Pierre De Fredi, Baron de Coubertin (Plate 159), born on 1 January 1863. In 1883, Pierre de Coubertin went to England, having read many books on teaching methods being used across the Channel, particularly Taine's *Notes sur l'Angleterre*. 'There he visited many schools, met a lot of important people and returned to France dazzled by what he had seen. From then on, his whole mind was focused on the phenomenon of sport in education.'[22] In 1886, totally won over to English ways, he took up his pen to write *La réforme sociale*, in which he proposed a reform of French education. At the age of 25, as Secretary of the Committee for the Preparation of Physical Exercises in Education, he was granted in 1888 an audience by President Sadi Carnot, who listened carefully to his ideas. That same year a journalist, Pascal Grousset, established the National League of Physical Education, whose avowed goal was to combat the 'Anglomania' of Coubertin's Committee, nicknamed the Jules Simon Committee after the Minister of Education. Many eminent figures were members of the League,

including Marcellin Berthelot, Clémenceau, Pasteur and Jules Verne. Nevertheless in 1889, Coubertin was appointed France's representative to a congress on physical exercise held in Boston, Massachusetts.

On his return, he worked with even greater determination on his planned reform of the whole French education system. Then, in the course of 1889, he sent a thesis on the moral dimension of athletics to the *Association pour l'Avancement des Sciences*. At the end of 1889, Georges de Saint-Clair transformed the Union des Sociétés Françaises de Course à Pied into the Union des Sociétés Françaises de Sports Athlétiques (USFSA), to which he wanted to affiliate the school associations inspired and in many cases actually established by Coubertin. In 1890, the reform of French education was finally decreed and Physical Education and Sport were incorporated into the curriculum.

In 1891, Pierre de Coubertin transformed the Jules Simon Committee into the Conseil Supérieur de l'Education Physique. Father Didon, principal of Arcueil College, and one of his admirers and disciples, had the words 'Citius, Altius, Fortius' (faster, higher, stronger) embroidered on the pennant of his school club. These words were to become particularly famous, since they were chosen by Coubertin as the motto of the Olympic Games. On 25 November 1892, at an official ceremony presided over by the President of the Republic and held in the Great Amphitheatre of the old Sorbonne in Paris, Coubertin launched the idea of establishing 'the Olympic Games of the Modern Era'. Admittedly, the idea was not a new one. As early as 1834 Gustav Schartau had supervised the organization of the Scandinavian games, which were inspired by the Games of Ancient Greece. In 1850, an unsuccessful attempt to revive the games was made by a rich Greek tradesman, Evangelios Zappas. Inspired by the dream of a Greek renaissance, he organized an Olympic competition but lost a lot of money and achieved very little. In 1869 in Great Britain, the Much Wenlock 'Olympic Games' were held. None of these initiatives came to anything, however. Between 1874 and 1881, archaeological excavations carried out in Olympia by the German archaeologist Ernst Curtius had once again drawn attention to the ancient site of the Greek Games. A series of articles by Philippe Daryl, the pseudonym of Pascal Grousset, also helped promote the idea of a modern version of the Olympic Games.

International tension made Coubertin responsive to pacifist ideas, and in *Pédagogie Sportive* he wrote: 'Effort is the supreme joy; success is not an end but an incitement to aim higher; the individual has value only in relation to humanity as a whole.'[23] Coubertin's views would very soon be heard well beyond the frontiers of France and his hopes were expressed in the following terms: 'The time has come for international sport to play a new role in the world. Germany has dug up what remains of Olympia, why should France not succeed in restoring its splendour?'[24]

### The revival of the Olympic Games: Establishment of the IOC

The revival of the Olympic Games was at last officially pronounced on 23 June 1894 in the Great Amphitheatre of the new Sorbonne by the international congress of universities and sporting bodies convened for the purpose. An International Olympic Committee (IOC) was set up

comprising six members. Coubertin was its president from 1896 to 1925. He nominated the other members – a Greek, a Swede, a Russian, a Hungarian and an Argentinian – and they drafted an Olympic Charter. Later, the make-up of the IOC was to change. 'Why did I revive the Olympic Games? To ennoble and strengthen sports, to ensure that they would be independent and long-lasting, and thus to enable them better to fulfil the educational role incumbent upon them in the modern world. And for the glorification of the individual athlete, whose existence is necessary for the muscular activity of the community, and whose prowess is necessary for the maintenance of a general spirit of competition.'[25]

Coubertin saw himself as one 'rebelling' against the 'worm-eaten philosophy' of the social and educational order and decided to create a new system of education for his own country and a new form of dialogue between all the countries in the world through sport. He expressed the wish that the first of the genuinely international, modern Olympic Games should be held in Paris in 1901. However, he gave way to the Greek Government, which was accorded the honour of hosting the first international games in Athens from 5 to 13 April 1896 on the site of the ancient games. A Greek patron from Alexandria, Averoff, financed the reconstruction of the stadium built in the fourth century BC, and other costs were subsidized by the Greek Government with the aid of a public subscription and sales of commemorative stamps. Built on the side of Mount Hymette, the stadium is entirely of marble and is U-shaped.

### First new event: the marathon

Two hundred and thirty Greek and 81 foreign athletes competed at the Greek games. The programme comprised nine disciplines and 43 events, including a new one: the *marathon*. This event was conceived and suggested by the French philologist, Michel Bréal, in honour of the valiant soldier Philipides, who ran 42 kilometres from the town of Marathon to bring news of the victory over the Persians (490 BC) to Athens, and thus became the symbol of a nation and of a supreme mission. In 1895, 'Bréal wrote to Coubertin to tell him he would be giving a silver cup to the runner who, having set off from Marathon, reached Athens the first'.[26]

'After the Frenchman Albin Lermusiaux and the Australian Edwin Flack had dropped out, having taken turns to set the pace, Spiridon Louys, the "water-carrier from Amaroussi", a working-class district of Athens, won the marathon on 10 April, causing an explosion of nationalist feeling.'[27] 'A cannon shot boomed out and 60,000 hearts beat as one. At first there was blank silence, and then a shout of joy. Louys entered the stadium. His final lap was both agony and bliss. Two Greeks lifted him from the ground, hoisted him onto their shoulders and carried him to the King. Greece was reborn.'[28] Coubertin, applying 'sports psychology' before it had been invented, assessed the hero's success in the following terms: 'Spirodon was a fine-looking shepherd dressed in a common *fustanella* and a complete stranger to scientific training methods. He prepared himself for the race by prayer and fasting and is said to have spent the previous night in front of icons lit with candles. From then on I was convinced that the mind played a much more powerful role in sport than is normally believed.'[29]

And so began the legend of the modern games, to which numerous new events were to be added in the course of the twentieth century. The very first champion of the modern era, however, was the American James Connolly. He covered 13.71 m in the triple jump, beating the Frenchman Alexandre Tuffere's performance (12.7 m) by more than one metre.

## THE OLYMPIC GAMES FROM 1900 TO TODAY

It was decided that the modern Olympic Games, like those of Ancient Greece, should be held every four years. During the first games in Athens, the idea of making Greece the site of all future Olympic Games was widely mooted, but Coubertin was afraid that Athens would be unable to bear such a financial and organizational burden every four years. 'At the banquet given at the close of the Athens games of 1896, he therefore proposed that all major cities throughout the world should host the games in turn.'[30] But the organizers were frequently tempted to establish a permanent site for the games, owing to the exorbitant cost of providing facilities in keeping with requirements. Hitler proposed Germany for this purpose after the Berlin Olympics of 1936; then, after the Montreal games of 1976, the idea of a permanent site close to Olympia was again considered, though without any practical steps being taken to date. Given the scale of the economic benefits and the prestige conferred by the games, a great number of candidate cities continue to vie for this privilege. Rome is the only city ever to have asked for the games to be relocated. It gave up the task of hosting the Fourth Olympiad owing to force of circumstances (the eruption of Vesuvius in 1906) and the 1908 Games were reassigned to London.

The second Olympic Games were held in Paris in 1900, on the site of the Universal Exhibition, with the participation of 24 Olympic Committees and 1,225 athletes, including for the first time 19 women. The first female gold medallist was the British tennis player Charlotte Cooper. The organizers of the exhibition spread the competitions over five months, an arrangement not in keeping with the Olympic character of the events.

The same mistake was made in the United States at the Third Olympiad of 1904 in Saint-Louis, where events were spread over more than four and a half months and were lost amid the chaos of the Universal Exhibition. These games were attended by only 11 nations and 496 athletes. The London Games of 1908 were truly international, with 2,059 athletes from 22 nations. At these games, archers Willy and Lottie Dod became the first brother and sister medallists, and for the first time an athlete – Dorando Pietri, a marathon runner from Capri – was disqualified for drug-taking.

At the Stockholm Olympics of 1912, the growing appeal of the games was confirmed as they were attended by 28 nations and 2,541 athletes (including 57 women), and there were 102 events. These games were a model of efficiency, since the Swedish hosts officially introduced the use of electronic timing devices, as well as the first loudspeaker system. Sweden refused to allow boxing matches on its territory, which prompted the International Olympic Committee to limit the powers of the host country in

relation to the preparation of the programme for the games. The most popular hero of the 1912 games was Jim Thorpe, a Native American from Oklahoma. Thorpe won the five pentathlon events and broke the world record in the 10 decathlon events.

## Olympic protocol becomes more elaborate

The 1920 games in Antwerp, Belgium, were the first to fly the Olympic flag with its five rings (representing the five continents), and to require athletes to take an oath. At the age of 72, Swedish marksman Oscar Swahn won a silver medal in the team double-shot at a moving target event, becoming the oldest medallist in the history of the games. The games were attended by 29 nations and 2,669 athletes, including 78 women, and featured 154 events. Pierre de Cubertin's motto for the Olympic Games – *Citius, Altius, Fortius* (faster, higher, stronger) – was first introduced at the 1924 Olympics in Paris. The games were fast attracting more nations and gaining more media attention. The number of participating countries rose from 29 in 1920 to 44 in 1924 at the Paris games, which were covered by more than a thousand journalists. The ceremonial aspects were also becoming more marked with each successive Olympiad, and the Paris games saw the introduction of the ritual hoisting of three flags during the closing ceremony: the flag of the International Olympic Committee, that of the host country, and that of the next country to host the games.

The Olympic flame was lit for the first time at the Amsterdam games in 1928, during the opening ceremony, and the Greek delegation led the march-past of athletes with the delegation of the Netherlands, the host nation, bringing up the rear. Greece at the front, host country at the back, was henceforth part of the Olympic protocol. It is thus easy to see how much more elaborate the Olympic ceremonial was becoming, and how it was becoming full of symbolism: official opening of the games by a head of state, carrying of the Olympic flame and lighting of the Olympic fire, Olympic oath sworn by an athlete chosen for his or her achievements, march-past of the National Olympic Committees with the flags of their countries, headed by Greece, and for the first time, in Munich in 1972, the swearing of an oath by officials at the opening ceremony.

## The Winter Olympics

When the IOC instituted the Winter Olympics, the first games were held in Chamonix, France in 1924 (Plate 160). The Winter Olympics are devoted to sports involving movement over snow and ice, the main ones being cross-country skiing, downhill skiing and ski-jumping, the giant slalom (since Oslo, 1952), figure skating (single or in pairs), speed skating, snowboarding (an American invention), bobsleigh, and (by way of team games) ice hockey. The first ski factory was set up in Christiana, the old name for Oslo, in 1886. In 1892 the International Skating Union was established in Scheveningen, in the Netherlands, and the first world figure skating championship was held in Saint Petersburg, Russia, in 1896. From the beginning of the twentieth century, winter holiday resorts such as Saint Moritz (Switzerland), Briançon (Hautes Alpes, France), and Chamonix (France) made a very important contribution

to the development of winter sports and the organization of championships. The nineteenth winter games in Salt Lake City (Utah, United States) in February 2002, brought together more than 2,400 athletes competing in 78 events, figures hitherto unequalled in the history of the Winter Olympics. But the first games of the new millennium were marred by a scandal leading to the resignation or dismissal of a number of members of the IOC who had been denounced by the press for corruption in the vote to designate Sydney (for the 2000 Olympics) and Salt Lake City for the Winter Olympics. This revealed the extent of one of the most undesirable aspects of the commercialization of sport.

## The Paralympic Games

The Paralympic Games were instituted to give thousands of physically or mentally handicapped athletes in the world the opportunity to take part in international competitions. With the introduction of these games, the twentieth century gave sport a new dimension. The main initiator was Ludwig Guttman, a neurosurgeon at Stoke Mandeville Hospital near London, who had the remarkable idea of organizing games for his paraplegic patients, Royal Air Force veterans wounded in combat during the Second World War, to be held in parallel with the London Olympic Games in 1948. On the first day of the London Olympics, just as the games began, he organized the first games for handicapped persons in wheelchairs at his hospital. However, the first Paralympics were not held until 1960, when Rome was host to 300 handicapped athletes.

The Paralympic Games are held after the summer Olympics and are now the second largest sporting event in the world in terms of the number of participants – 5,000 at the Sydney games – emphasizing the need to make better provision for everybody in modern society, since everyone has the same need for joy in life and for self-esteem derived from the appreciation of others. People with different handicaps take part in the games: amputees (lower or upper limbs), tetraplegics or paraplegics in wheelchairs, people with visual handicaps, learning difficulties or certain types of motor deficiency. The sports are highly varied: shooting, archery, athletics, swimming, cycling, table tennis, judo, weight-lifting, sailing, and more. Impressive feats are performed, but they need to be more widely covered in the media if further progress is to be made in breaking down stereotypes and changing behaviour.

## Women's participation in the Olympic Games

After the Amsterdam games (1928) the number of women taking part steadily increased. They were finally authorized to compete in the gymnastics and athletics events, having previously competed only in tennis, golf, figure skating, sailing, swimming, fencing and archery. In Helsinki in 1952, the Soviet Union took part for the first time and its female gymnasts turned out to be particularly impressive. They succeeded in dominating the events for forty years until the Soviet Union split up.

The question of the role of women in sport was highlighted very early on by international organizations such as the Socialist Workers' Sports International (1913),

the International Workers' Association for Sport and Physical Culture (1920), more generally known as the Lucerne Sports International or LSI, the Red Sport International (1921) and their national branches, and also by the vast network of sports and cultural associations linked with the non-Marxist left. Women won the right to vote in 1914 in the United States, in 1919 in Germany, and in 1918 in Great Britain (at the age of 30, then at the age of majority in 1928). Women's sports clubs were set up. In France, the Fédération Sportive et Gymnique du Travail (FSGT), founded in 1934, played an active part in a broad movement to promote a rapid increase in the numbers participating in sport, men as well as women. The combined effects of the democratization of public education, the political emancipation of women and the work of the sports associations and federations gave a tremendous boost to women's sport in the industrialized countries.

Only with the advent of decolonization and national independence did female athletes from Africa and the Middle East emerge to give such dazzling performances at the Olympic Games. Having been only 19 to compete in the 1900 Paris Olympics, the number of women competing in

the Sydney Games in 2000 was 4,069, compared with 6,582 men, an overall percentage of nearly 40 per cent

In May 1999, the former coach of France's national football team, Aimé Jacquet, told a national conference in Paris on women and sport: 'In addition to participating and competing, women still have to secure a place in the administrative field. Their sensitivity, intuition and sense of responsibility should equip them to play a full part in the work of organizational and decision-making bodies. But they are not doing so at the moment'.[31]

Table 10 and Figure 3 show how far women's participation in the Olympic Games has increased since the end of the nineteenth century.

## The first African Games: Brazzaville

The first African Games were held in Brazzaville (Congo) in 1965. An all-purpose stadium – among the first such architectural achievements to be built on this scale in Africa (800 million CFA francs) – had been inaugurated in June 1964 so that the games could be an all-Africa event.

*Table 10* **Male and female athletes participating in the Summer Olympics**

| Year | City | Nations | Athletes | Men | Women | Events |
|------|------|---------|----------|-----|-------|--------|
| 1896 | Athens | 14 | 245 | 245 | 0 | 43 |
| 1900 | Paris | 24 | 1,225 | 1,206 | 19 | 87 |
| 1904 | Saint Louis | 13 | 689 | 681 | 8 | 94 |
| 1908 | London | 22 | 2,035 | 1,999 | 36 | 109 |
| 1912 | Stockholm | 28 | 547 | 2,490 | 57 | 102 |
| 1920 | Antwerp | 29 | 2,669 | 2,591 | 78 | 154 |
| 1924 | Paris | 44 | 3,092 | 2,956 | 136 | 126 |
| 1928 | Amsterdam | 46 | 3,014 | 2,724 | 290 | 109 |
| 1932 | Los Angeles | 37 | 1,408 | 1,280 | 127 | 116 |
| 1936 | Berlin | 49 | 4,066 | 3,738 | 328 | 129 |
| 1948 | London | 59 | 4,099 | 3,714 | 385 | 136 |
| 1952 | Helsinki | 69 | 4,925 | 4,407 | 518 | 149 |
| 1956 | Melbourne | 67 | 3,184 | 2,813 | 371 | 145 |
| 1960 | Rome | 83 | 5,348 | 4,738 | 610 | 150 |
| 1964 | Tokyo | 93 | 5,140 | 4,457 | 683 | 163 |
| 1968 | Mexico City | 112 | 5,530 | 4,750 | 780 | 172 |
| 1972 | Munich | 121 | 7,123 | 6,065 | 1,058 | 195 |
| 1976 | Montreal | 92 | 6,028 | 4,781 | 1,247 | 198 |
| 1980 | Moscow | 80 | 5,217 | 4,093 | 1,124 | 203 |
| 1984 | Los Angeles | 140 | 6,797 | 5,230 | 1,567 | 221 |
| 1988 | Seoul | 159 | 8,465 | 6,279 | 2,186 | 237 |
| 1992 | Barcelona | 169 | 9,367 | 6,659 | 2,708 | 257 |
| 1996 | Atlanta | 197 | 10,320 | 6,797 | 3,523 | 271 |
| 2000 | Sydney | 199 | 10,651 | 6,582 | 4,069 | 300 |

*Figure 3* **Women's participation in the Olympic Games**

## SPECIFIC SPORTS

### Football

Regarded as the 'king of sports', football, also known as 'soccer' in the United States, is now the most popular sport in the world and is played in all countries without exception, on all five continents, by several million people. No event arouses as much passion and excitement among the population of the whole world as the World Cup. This competition, held every four years, is the best known of all international sporting events, with every country eager to take part in the great 'sporting festival'. This is confirmed by Dominique Lejeune as follows: 'Among the first official steps taken by the new independent States, one of the commonest was application for membership of FIFA (Fédération Internationale de Football Association), which is particularly important to the national self-assertion of such States'.[32]

First held in Uruguay in 1930, the World Cup was the starting point for a confrontation between South America's stylistic virtuosity and Europe's combination of power and method. Brazil, Germany, Italy, Argentina and Uruguay have often been among the winners of the World Cup. In 1960, the World Club Champions Cup was launched as a competition between the best clubs of the different continents. In Europe there are three separate cups: the European League Champions Cup, first organized in 1956; the UEFA Cup established in 1957; and the Cup Winners Cup, established in 1960 for the winners of the national cups in each European country. The CAN, or African Nations Cup for football, is a competition for national teams established in 1957.

South America has been particularly well represented in the World Cup by Brazil, which is the only country to date to have won the prestigious trophy five times (in 1958, 1962, 1970, 1994 and 2002). The best scorers in the World Cup have left their mark: Gerd Muller (Federal Republic of Germany), 14 goals in 1970 and 1974; Just Fontaine (France), 13 goals in 1958; Pelé (Brazil), 12 goals from 1958 to 1970; and Ronaldo (Brazil), 12 goals in 1998 and 2002. The Women's World Cup was first held in China in 1991, where it was won by the United States. It was next held in Sweden in 1995 and won by Norway, and then in the

'Brazzaville' was a decisive step in African sport, and led to the decision to found the Conseil Supérieur du Sport en Afrique (CSSA), even though it was impossible for countries still under colonial rule (Mozambique, Angola, Guinea-Bissau, Cape Verde; and South Africa under apartheid, shunned by Africans), to take part in international meetings. Its Secretary-General was the Congolese Jean-Claude Ganga, working under the patronage of the President of the Republic, Alphonse Massambat Débat, and Avery Brundage (IOC). The object of the CSSA was to encourage the development and diversification of African sport, which was subsequently to enhance the Olympic Games by its participation, as if in answer to Pierre de Coubertin's most fervent wishes. Unfortunately he did not live to see his hopes fulfilled (he died in 1937).

The first black Africans had already made an appearance at the Rome Olympics in 1960. The Ghanaian Ike Quartley took the silver medal in light-welterweight boxing, and the Ethiopian Abebe Bikila, creating the legend of the 'barefoot runner', outran the Moroccan Rhadi Ben Abdesselem, to become the first black African gold medallist. Then in 1964, in Tokyo, Abebe Bikila became the first athlete to win the marathon for a second time (Plate 161). The first African games aroused great enthusiasm and gave a powerful impetus to sport in the young nations of the continent. Athletes from North Africa fought off all contenders to win the swimming and tennis competitions. The second African games were held in Lagos, Nigeria, and in 2000 the seventh African games took place in Johannesburg, South Africa, no longer in the grip of apartheid. At those games, the Cameroon delegation alone numbered 200 participants.

*Table 11* **Winners of the World Cup 1930-2002**

| Year | Place | Winner | Year | Place | Winner |
|------|-------|--------|------|-------|--------|
| 1930 | Uruguay | Uruguay | 1974 | Germany | Germany |
| 1934 | Italy | Italy | 1978 | Argentina | Argentina |
| 1938 | France | Italy | 1982 | Spain | Italy |
| 1950 | Brazil | Uruguay | 1986 | Mexico | Argentina |
| 1954 | Switzerland | Germany | 1990 | Italy | Germany |
| 1958 | Sweden | Brazil | 1994 | United States | Brazil |
| 1962 | Chile | Brazil | 1998 | France | France |
| 1966 | England | England | 2002 | Korea-Japan | Brazil |
| 1970 | Mexico | Brazil | – | – | – |

United States in 1999, where it was won by the American team, who thereby confirmed their world supremacy. The following Women's World Cup was held in 2003 and was won by Germany. Originally to be played in China, the competition was relocated to the United States due to the SARS scare at that time.

There are two other variants of football, which are also very popular in the areas where they are played: American football and Australian football. Although the former has spread beyond the American frontier, the National Football League, with 30 professional teams, is still the most important championship.

## Football, media coverage and violence

Football rapidly became professionalized because of its urban base and the vast amount of media coverage it receives. It has become one of the items of mass radio and television consumption; it is played by a minority of professionals and followed by a huge mass of listeners and viewers. The televising of a football match, nationally or internationally, provides a real 'spectacle', highly colourful and staged using the most sophisticated audiovisual techniques. Football is an amplifier of nationalist, and often chauvinist, sentiment, which rapidly spills over into violence. It causes mobs to gather and exacerbates passions and antagonisms. 'Sport seems to be like a mirror that gives a faithful or distorted image of contemporary society, and there is every chance that sports writing will demonstrate how this mirror works … Sports contests bring into play passionate drives that are deeply embedded in a culture. They provide a particularly effective release for feelings of local or national patriotism.'[33]

Football hooliganism is a recent phenomenon and some sociological analyses suggest that it is often due to the breakdown of the family unit, leading to loss of parental control over young people who then take up with others who are also victims of unemployment and prone to urban delinquency. In the view of Manuel Comeron and Serge Govaert, football hooliganism is a phenomenon 'characterised by aggressive behaviour on the part of an individual or individuals, engendered within the context of a sporting event. The media began to report on the phenomenon in the 1960s with the increase in scenes of violence involving spectators at football matches in Great Britain'.[34] They note that these hooligans are publicity-seekers who like the public attention that they gain through the media.

Christian Pociello believes that the excessive media coverage of football hooligans and skinheads is a contributory factor in the continuation and even the growth of the phenomenon: 'By becoming, as it were, a spectacle within a spectacle, football hooligans are able to give vent to this manic desire to show off, causing a commotion on the terraces, forming vast collective patterns "in order to be seen" or having violent fights with other supporters to feel that they are alive … Television, initially detached and subsequently complicit, clearly caters to this desire by providing a forum.'[35] J. M. Brohm takes a more radical view and feels that football as a spectator sport is by its nature responsible for the violence it engenders: 'Today, it is no more possible to disassociate vandalism, "fan-aticism" and hooliganism from professional football matches than to separate the foam from the beer imbibed in industrial

quantities by the soccer fanatics … The Heysel massacre of May 1985 … showed millions of television viewers throughout Europe the barbarity lurking deep beneath the surface of the sporting event.'[36]

In Northern Ireland, the religious divide between Catholics and Protestants can be seen in the football stadium as in the political arena. In Glasgow, there is more to football than sporting rivalry. A war of religion is fought out between Catholic Celtics and Protestant Rangers and a permanent state of tension reigns between the two camps.[37] Violent supporters in different countries vie with each other in 'eccentricity': British 'hooligans', German skinheads, Italian *tifosi*. At the 1998 World Cup, the British hooligans earned particular attention through their ability to 'export' gratuitous violence. But using football as a pretext for settling the political differences that simmer beneath the surface is common practice all over the world. Examples include 'the football war' between El Salvador and Honduras in 1969, and the upheavals in stadiums in Algeria, China (1988), and countries in sub-Saharan Africa, leading to violent physical confrontation, expulsion and displacement of populations.

According to a Council of Europe table showing violence in football stadiums since the beginning of the century, there have been 965 deaths and more than 5,600 injuries. 'This figure covers every stadium in the world and, given the frequency of national and international competitions, it is not very high although it is most regrettable. It bears no comparison with the figure for victims of other forms of violence over the same period. Leaving aside wars and revolutions, we need only cite criminality, accidents at work and road accidents.'[38] It should be noted that the number of deaths and injuries can also be attributed to the dilapidated or unsafe condition of some stadiums, which has led to the collapse of terraces (Glasgow in 1902 and Bastia in 1992), the collapse of barriers and the breaking of railings (Cairo in 1974), the burning down of a wooden grandstand in Bradford in 1985, and crowd stampedes in which a great many spectators have been trampled, as in Bukavu (Congo, Zaire) in 1974.

However, despite these sporadic manifestations of violence, football is still one of the sports that most brings about fellowship and friendship between individuals and peoples, causing racial barriers to fall.

## Cycling

Cycling was on the programme of the Athens Olympics in 1896, although the women's event was not approved until 1984. Cycling as a sport nevertheless has a long and illustrious history, marked chiefly by the most famous cycling event of all, the Tour de France, which is held every year in the summer. It draws teams of riders from all over the world who compete over a space of three weeks in events that range from 1,000 metre sprints to the race proper in stages. In 1900 the Frenchman Henri Desgrange, a cycling champion during the 1890s, founded the daily publication *Auto-Vélo*, which was well financed and published on yellow paper (hence the practice, introduced after the First World War, of awarding a yellow jersey to the winner of each stage and to the final winner of the Tour). This publication funded the launch in 1903 of a Tour de France covering 2,500 kilometres in six stages, which superseded the old Paris-Roubaix and Paris-Rouen races. The Italian papers

created the Tour of Lombardy in 1905, the Milan-San Remo in 1907 and the Tour of Italy (Giro d'Italia) in 1909. The Belgians launched the Tour de Belgique in 1907.

Cycling is the sport that has caused the most ink to flow about the scandal of doping in sport, ever since the physiotherapist of the Festina team, led by Richard Virenque, was taken in for questioning by customs officials during the 1998 Tour de France. Willy Voet was carrying large quantities of anabolic steroids (classified as performance-enhancing drugs) in his car, as well as a flask of liquid amphetamines. This incident prompted an argument and a huge outcry in the media on the subject of doping in sport and revealed a surprising degree of hypocrisy on the part of the journalists and experts who moved in the world of high-profile sport, of which cycling is a part. The cyclists protested their innocence, but by now it was common knowledge that '100 per cent of the riders who finished a Tour de France used illicit substances and the poor innocents who did not take drugs at this level never saw the finishing line because they never arrived within the time limits'.[39] For a long time, doping remained out of sight, hidden behind a number of scapegoat sports like body-building, weight-lifting and athletics in general, which made the other sports look blameless. What cost Ben Johnson so dearly was that his muscular development was too obvious. But even in the 1970s, when the female swimmers of East Germany were dominant, swimming in particular gave rise to 'the first suspicions that pharmaceuticals were being used to create veritable "athletic machines" in the laboratory'.[40] Nowadays, records are being beaten more and more frequently and, instead of scepticism being aroused, success is attributed to superior training techniques and equipment. Athletes trained to the level required for the increasingly difficult challenges are unable to keep pace because matches and competitions are held too frequently, a problem compounded by jetlag and stress.

The American sprinter Florence Griffith-Joyner died on 21 September 1998 at the age of 38. She had been a triple gold medallist at the Seoul Olympics (100 m, 200 m, and 4 × 100 m), and at the time of her death she had been the 100 m and 200 m world-record holder. She had set out to smash the existing women's 100 m record of 10.5 seconds and did so at the cost of her life. She gave up her career at the height of her glory, hoping to remain in good health after years of doping, but the drugs had taken their toll. Drugs have a disastrous effect on health, causing strain-related injuries in the short term and cancer and heart disease over a longer period.

Nowadays we speak of cycling and doping as a particularly ill-fated 'couple', but all sports seem to be affected by the problem, now almost a routine feature of high-level competition. Drugs provide a means of producing champions within a very short time. They also explain other phenomena, such as the reduction in the upper age limit for a professional footballer from 36 to 32. The practice of doping is a flagrant violation of the stated objectives and ideals of the Olympic movement and is inconsistent with the much-needed democratization of sport in society. It is also at odds with the way in which the image of the body is projected today, i.e. in would-be scientific terms, which pretend to ignore the harmful, toxic and destructive effects of the substances absorbed. Commercial pressures, the desire to set new records and to improve performance at all costs, even at the risk – supposedly a calculated one – of

reducing life expectancy, all of these factors ensure that artifice prevails over nature. It would be good if we could manage to overcome the contradictions between theories that claim to be scientific and the dominant ideology of an economic system that sets a premium on the quest for profit through optimum performance.

## Boxing

Boxing is one of the oldest combat sports in the world. Although it is governed by strict rules designed to protect the boxers, from time to time deaths still occur, giving boxing its reputation as the most violent sport of the twentieth century. There are many who would like to see the sport banned. Sweden, for example, refused to have boxing on the programme of the 1912 Stockholm Olympics. Boxing, in much the same way as football, is one of the great sports, among the most popular because it was originally regarded as the 'sport of the poor' and because it enjoys very wide media coverage. American television began to promote boxing galas as early as 1941, giving the sport a particular style by broadcasting matches as major entertainment to be viewed on giant screens. But then satellites conquered the world (Relay I in December 1962, Telstar, then Relay II). Nowadays, through this power of the media, boxing has taken its place among the sports that generate the most lucrative transactions in the Western world, with the United States in the lead. American television selects the best boxers at all weight classes and makes the public particularly demanding.

At the Rome Olympics, an 18 year-old black American boxer, Cassius Clay, first came to public attention by winning the gold medal in the light-heavyweight category. 'Of all boxers, Cassius Clay is certainly the most good-looking.... His insults destroy the opponent's ego, adding to the damage inflicted by his blows. At every boxing venue in the world, "Muhammad Ali" is idolized.... His opponents, black or white, are like barbarians compared with him. They merely fight for a title; Muhammad Ali defends a style associated with a cause. In this way he is eclipsing the dramatic rise of American boxers, a new generation which is threatening to make the presence of black American boxers in the ring, and the interests of their sponsors, part of the established order. Joe Louis was the idol of black American soldiers fighting in the Second World War. Ali, the rebel, has come to be the expression within the United States of the revolution of people in the Third World, whom faith alone can save.'[41] 'Never has a heavyweight boxer used his power to such devastating, total effect; never has a black boxer made such an event of his reunion with the African continent.... A defender of the weak and the oppressed, a man who refused to fight in the Vietnam war, Clay had an amazing ability to take punishment and could not fail to win in Kinshasa'[42], where he beat George Foreman.

As a result of the system of broadcasting rights, the financial stakes are higher in boxing than anywhere else in the world of sport. The match between Mike Tyson and world heavyweight champion Lennox Lewis on 9 June 2002 in Memphis, Tennessee, featured ringside seats at $2,400, and hotels in Memphis, Shelby County and Tunica County provided 24,000 overnight stays for visitors who had come for the fight.

# SPORT AND POLITICS

## Sport and social class

Politics has always had its place in the stadiums, ever since the days of ancient Olympia. We need only observe that the Panhellenic games provided a truce in the interminable wars and served to unite the Hellenic peoples. Even at that time the dominant ideology set the rules, since foreigners and slaves were banned from competing in the games. Subsequently, and throughout the long history of sport, different social classes have had their own games: noblemen would meet in tournaments and in knightly duels, and peasants from the countryside nearby would play each other at *soule* or *calcio*.

British sport remained aristocratic and bourgeois until the middle of the nineteenth century, when it began to undergo rapid democratization. Sports nevertheless continued to be divided up on a class basis: boxing and football were long left to the working class, whereas rugby, rowing, tennis and athletics were chiefly the preserve of university students. The politicization of sport has been accentuated, however, by the wide attention given to it by the media. Today, at the dawn of the twenty-first century, sport has rapidly become a perfect channel for the transmission of political or even racial values, an object of propaganda, the symbolic embodiment of a nation and its economic, social or military power. Media coverage encourages further politicization of sport. Historically, the organization of major sporting events was a response to ideological presuppositions. Internationally, the years 1919-1920 marked the beginning of the period in which sport was used by the so-called democracies as a political instrument of exclusion or boycott. The victors in the previous war refused to meet the vanquished on the 'neutral territory' of sport, and international sports meetings with defeated or neutral countries were only resumed on condition that they became members of the League of Nations.

## Sport and international relations

In Europe, these international sports events were then further transformed into instruments of foreign policy. 'The resumption of the international sporting calendar was inaugurated by the Interallied Games of 1919. The defeated nations and Bolshevist Russia (which became the Union of Soviet Socialist Republics at the end of 1922 and was banished from the family of nations) were excluded from international competitions for several years. It is worth noting that, of the former belligerents on the side of the central European empires, Germany and Hungary were singled out for special treatment; Austria, Bulgaria and Turkey were admitted to the Paris Olympics in 1924, having been absent from the Antwerp games in 1920.'[43]

A second fundamental feature of this period in the field of international relations was the establishment of a large number of separate socialist sports internationals, the October Revolution having led to a split in international workers' sport. The Socialist Workers' Sports International had been in existence since 1913, having superseded an international socialist physical education association. Other movements were created subsequently: the International Workers' Association for Sport and Physical Culture in France in 1920, and the Red Sport International (RSI) in Moscow in 1921. The founding of the RSI under the aegis of the Communist International was part of the movement to promote world revolution: it was necessary to 'go to the masses', to strive towards winning over the working majority in the long term in order to disengage it from the bourgeois organizations.

'As early as 1920, the French Government adopted a number of measures on top-level sport, which clearly indicate that sport had become a matter of state concern.'[44] The USSR had very few sporting contacts with countries of the capitalist world, particularly during the New Economic Policy (NEP) years, when proletarian physical culture – an aspect of 'Proletkult' (proletarian culture) – was supposed to surpass bourgeois physical culture and sport, considered outdated and even degenerate. In Paris, in 1934, the RSI organized an international meeting of athletes 'opposed to fascism and war', a political/sporting event replacing the Moscow *Spartakiade*.

In the inter-war years, the Italian Fascists regarded athletic training as a preparation for war, and the athlete was seen primarily as a combatant. *Il Duce* encouraged the development of boxing and wrestling and had a decided preference for the martial pursuits of aviation and fencing. In 1931, shortly after the proclamation of the Spanish Republic, Barcelona lost the right to organize the 1936 Olympics. 'Berlin was [therefore] chosen as host city, before the Nazis came to power. As the fateful day approached, a boycott campaign was organized by left-wing activists and some Jewish communities on the grounds that the policy of racial discrimination pursued in Germany was contrary to the principles of the Olympic Games. The influence of politics on sport was blatant.'[45]

## Sport and racism

Hitler's Nazi regime deliberately set out to use sport for political purposes. It accordingly agreed to host the 1936 Olympics, and propaganda head Walther Funk himself stated that the games were an opportunity for propaganda without equal in the entire history of the world. But then the black American athlete Jesse Owens performed his legendary feat of winning four Olympic events: long jump, 100 metres, 200 metres and 4 × 100 metres, thereby cocking a snoot at the racist theories of Nazism. In journalistic circles it was rumoured that Hitler had deliberately left the stand to avoid shaking Owens' hand.

On the question of racism in physical education policy, history tells us that colonialists were filled with 'great fear at the idea that native peoples might share the same physical activities with them'. Racial segregation was explicitly advocated by the French Government in the law of 1930 on Physical Education in the Colonies. 'The acknowledged fear of seeing the master/servant relationship overturned was compounded by fear of contamination. Physical education in the colonies came with its own share of assumptions about hygiene and it seemed advisable to keep European and indigenous populations apart, especially as epidemics of plague, cholera, typhoid, etc. were rife in the colonies … This was a persuasive argument for segregating young people in particular.'[46] Apartheid strategies of varying degrees of subtlety, adapted to each territory, were the characteristic upshot of colonial thinking.

Bernadette Deville-Danthu refers to the unseemly attempt by Marshal Lyautey, the French Resident-General in Morocco, to get Moroccan nationals to take part in the 1924 Olympics in an attempt to use sport to illustrate the policy of semi-autonomy he wished to pursue in the protectorate. 'His request was never followed up by the Metropolitan French authorities.'[47] In 1925, again in Morocco, it was forbidden to organize boxing matches between Europeans and indigenous inhabitants, 'the Europeans having probably not come to terms with the idea that the Senegalese, Battling Siki, had succeeded in stripping the French light-heavyweight champion, Georges Carpentier, of his title in 1922.'[48]

### Terrorism and the Olympics

The darkest time for the Olympics was nevertheless in Munich in 1972, when the Games were the target of a terrorist attack. On the morning of 5 September, eight Palestinian terrorists got into the Olympic village, killed two members of the Israeli team and took nine others hostage. These were subsequently killed, along with five of the terrorists and one policeman. After a 24-hour pause to mourn the victims, the Games were resumed, watched by millions of dismayed television viewers still in a state of shock. The sporting event that was meant to be a celebration of human brotherhood caused the whole world to weep, saddened and grief-stricken by what had happened. The ideals of peace and international solidarity, which had underpinned the creation of the Olympic Games by Pierre de Coubertin, had been utterly confounded.

## THE MEDIA AND THE COMMODIFICATION AND INTERNATIONALIZATION OF SPORT

Although, as we have seen, the first modern competitions date back to the nineteenth century, the move towards commodification, professionalization and internationalization in sport quite clearly began in the twentieth century. The role of the media in these developments appears to be fundamental and the media-sport relationship is regarded both as a love-match (according to former IOC president Juan Antonio Samaranch) and a marriage of convenience.

### The media as the paymasters of sport

Historically, media coverage of physical activities and sports got off to a fairly slow start in the eighteenth century, when it took the form of simple newspaper reports. Subsequently it developed at a dizzying pace, first with the appearance of a multiplicity of specialized sports journals and magazines, then with radio and finally with television. Through its contribution in terms of organization, financing and multifaceted technology, television played an active role in the development of certain sports – the major sports of today – by promoting their transformation into entertainment and their internationalization. The computerization of communications at the end of the twentieth century and the advent of the Internet promise

many more surprises from the 'sports industry' in terms of globalization and output.

In Europe, the first newspaper articles on sport appeared around the middle of the eighteenth century. In 1733, *The Boston Gazette* described the professional boxing match between John Faulconer and Bob Russell. But the first specialized sports journal was not published until 1838, *Bell's Life*, established in England by professional runners. In France, the fortnightly magazine *Le Sport*, targeting an aristocratic public, was first published in 1854. It was followed by *Le Vélo*, founded in 1891 by Pierre Giffard and Paul Rousset, and by Henri Desgrange's *L'Auto-Vélo* in 1900, which was renamed *L'Auto* in 1903, following a trial over breach of copyright. The former organized the first *Tour de France* in 1903 on the initiative of Geo Lefèvre, Desgrange's young collaborator, thereby establishing a new relationship between the media and sports competitions. The sports daily *L'Equipe* founded and organized the Le Mans 24-hour race in 1923. Since then, the sports press has experienced various changes and numerous upsets. Specialized journals are found in increasing numbers in kiosks, some of them being very short-lived, especially today.

### Media coverage and the internationalization of mass sport

'With the advent of radio, sporting events could be experienced live. Time and distance were eliminated and sport took full advantage of this means of mass communication. The use of radio developed in the course of the 1920s, and boxing was one of the sports to benefit from it. In 1921, the Dempsey-Carpentier fight, which brought in more than a million dollars, was broadcast in the United States by KDKA, a station that also provided commentaries on baseball matches.'[49] The invention of the transistor shortly afterwards increased the influence of radio tenfold, and it was this that has since enabled millions of listeners in rural Africa and most developing countries to listen to broadcasts of football matches. With radio came the art of live, multiplex broadcasting, which enabled listeners to follow several football matches or other sporting events live and at the same time. Then came television, which soon was to play a predominant role in the coverage of sport throughout the world, accentuating the trend towards internationalization already begun by radio.

### The major sports as entertainment and commodities

Television took its first steps and grew up, developing its technical capacities as it went, with and through sporting events. As early as 1948, television was on the spot to broadcast the finish of the Tour de France live from the Parc des Princes. Further developments followed, such as the use of the zoom lens in 1954, of the HF camera in 1957, the slow-motion replay in 1967, the split screen, cameras mounted on cars, helicopters or motorcycles (cycle races), and colour and high definition (HDTV). All resources were marshalled to improve the entertainment value of these major sports.

Changes and developments in modern sports are often attributable to the media that organize and promote their

competitions. Following the example set at the end of the nineteenth century by *Le Vélo* and *L'Equipe* (organizers of the first Tour de France and the Le Mans 24-hour race respectively), television has become involved in the organization and funding of sporting events. In the United States in 1986, Ted Turner (President and CEO of the multinational media conglomerate TBS) founded the Goodwill Games. Sport has taken over television screens, the cost of broadcasting rights has soared and some sports bodies have become veritable businesses operating in the industry of sport as entertainment.

'Many firms wish to have their name associated with a competition, a club or an athlete. Sport is of the utmost importance to standard television channels and there are specialized channels entirely devoted to sport. Television broadcast rights account for the bulk of the income used to fund the Olympic Games. They generated $907 million for the Atlanta games, of which only $559 million were received by the Organizing Committee, the rest going to the IOC! As a result, the cost of television rights rose further, accounting for 77 per cent of all income from the 1994 Winter Olympics, and, of course, that provoked tough competition between companies wanting access to the Olympics market. Advertisers accounted for a large percentage of the organizers' income: 38 per cent for the Los Angeles Olympics, 31 per cent for the 1986 World Cup, and 60 per cent for the 1988 Paris-Dakar rally.'[50]

Football spreads beyond the strict framework of competition, and matches are staged in a way so as to satisfy a range of requirements – political, logistical, security, aesthetic, moral and promotional – and also to convey the passion and emotion aroused. The game, the television and radio facilities and the spectators exist in a state of osmosis. 'The sporting event and its reconstitution, the televised show and its consumption, are all intimately connected; so much so that any sense of spontaneity or independence seems quite impossible. We are trying to square a circle that is much more vicious than is imagined, since this long chain of interests, long thought to be conflicting, perpetuates itself so obviously that readers of the sports pages no longer know today whether they are witnesses of, or active contributors to, the mild folly now taking hold.'[51]

**Television adapts sport to its own requirements**

Television refashions or tailors sport to suit its own requirements. It has thus got the federations of many sports to change their regulations and adapt the staging and organization of events to get them to fit in with television's technical, time and commercial requirements (inclusion of advertising breaks).

Television channels pay fortunes for the exclusive rights to broadcast the most prestigious events. Football and the Olympic Games have become important factors in the marketing of television programmes, video recorders, television rental services and sports clothing, especially when the Olympic Games or the World Cup are being held.

The business management of clubs and federations is sometimes transferred to outside sports marketing organizations, as Philippe Bughin explains with reference to international football: 'It is a curious but revealing fact that neither FIFA nor even UEFA have so far ever taken on the kind of sports marketing tasks that the all-powerful private enterprise, the NBA, is able to perform internally.'

'Since 1982, the international football federations have entrusted their business management to ISL Worldwide. This Swiss company, founded in 1982 and active throughout the world, is 90 per cent owned by the powerful ISMM (International Sport Media & Marketing) Group, a world leader in sports management with three hundred international sporting events to its credit, including no less than five world cups, four European championships and six Olympic Games.'[52]

European television channels are investing more and more in the major football clubs. In France, Canal+ owns PSG and M6 controls Girondins Bordeaux. In England, 'British television and media groups are currently acquiring stakes in whole groups of clubs in the Premier League (England's Division 1), in the hope of obtaining broadcasting rights for their matches more easily in the twenty-first century. The benefit to the clubs is obvious since the sale of a minor shareholding earns them millions of pounds, enables them to buy players and increases the price of their shares on the stock exchange'.[53]

The professionalization of sports such as football and rugby is causing a large number of players from the economically weaker countries to move to the more advanced European countries where they can make magnificent careers for themselves and earn vastly better incomes. Players from eastern Europe, Africa and South America are rushing to western Europe to offer their talents to different clubs, and in many cases they are simply being driven by pitiless market forces. Those with the good fortune to be caught up in this new Eldorado can hope for outstanding careers. For many others, it will be just a dream that does not come true. The 2002 World Cup (in the Republic of Korea and Japan) featured a Senegal national squad of which 20 players out of 23 played professionally for European clubs. Such are the paradoxes of the modern professional sports scene. The richest clubs have access to a vast global market of players, who are quite prepared to 'sell themselves' in exchange for the good life, since working and living conditions in their own countries are so difficult.

## PHYSICAL CULTURE AND SPORT AS A NEW WAY OF LIFE

### The sport industry, globalization and cultural cross-fertilization

Western Europe, starting from traditional, ritual and festive games, and passing through the sports revolution that stemmed from the Industrial Revolution, has arrived at games in their modern form – spectacular shows, heavily promoted by the media and reaching every corner of the world.

Football and rugby emerged from the schools and universities of Great Britain, basketball and volleyball came out of the distant lands of America, and these sports, having first made their mark in Europe, gradually spread to the rest of the world. In today's industrialized countries, caught up in the maelstrom of modern cultural trends, the relationship with the body has changed enormously under the combined effect of technical advances in training methods, the greater sophistication of today's audiovisual media, and the

relentless marketing of services in the sports sector and in body care in general.

It must be acknowledged that sport is gradually invading people's everyday lives, both in the so-called 'rich' industrialized countries of the North and in the so-called 'poor' developing countries of the South, and that society worldwide, with some exceptions, is quite clearly developing into a society dominated by leisure sports. This is something that has been fostered by the export of 'cultural industries'.

The change in outlook as many, varied cultures come into contact with each other and interact, the growing influence of the North on the South and East, in regard to individualization, the role of the media, professionalization, commercialization, and so on – all these factors are ushering in a new attitude towards oneself, greater attention to personal well-being and health, a new healthy way of living, and a new 'culture of the body'. The export of leisure sports and the practices associated with them are aspects of a cross-fertilization of cultures observable across the world, an 'inexorable cross-fertilization', as Senagalese writer and President Léopold Sedar Senghor so clearly foresaw. For the influence is reciprocal. It is interesting to see how the industrialized countries, for all their economic and media supremacy, have embraced the 'body cultures' of other continents, such as their martial arts (*judo* and *karate* from Japan, *kung-fu* and *t'ai chi* from China, *tae kwon do* from Korea, *capoeira* from Brazil). The industrialized world has shown an impressive enthusiasm for oriental sports over the past few decades (numerous martial arts federations have been founded), an interest increasingly shared by the rest of the world. Judo was on the programme of the very first African Games in 1965, where many African *judokas* competed, even though judo had only just made its first appearance as an Olympic sport at the 1964 Tokyo games, the first Olympic Games to be held in Asia. The practice of martial arts is often accompanied by initiation in a philosophy, in oriental 'wisdom', which would appear to be a significant benefit in an increasingly violent and selfish world.

We might still look forward to a future programme of Olympic events that includes the Brazilian martial art *capoeira*, of African origin but already well known and widely practised in Europe and throughout the world. Its originality lies in its being a traditional form of wrestling that is practised like a dance to a musical accompaniment played on particular instruments. This traditional wrestling is held in very high esteem in sub-Saharan Africa and is becoming increasingly important as the number of tournaments increases.

Genuine globalization of the sports culture will be achieved if we allow disciplines from every continent their due place, thereby creating an international sports culture that is the result of cross-fertilization, many-sided and varied.

### Democratization of sport and new forms of employment in sport

Since the Second World War, physical activities and sport have become a form of socialization. It is important to stress to what extent educational institutions have played an important part in making sport more democratic; physical education is included on the school curriculum in most countries. In the United States, intensive television coverage is given to American football, baseball and boxing. In Europe and Latin America, television broadcasts football, and in France cycling – especially with the Tour de France – is much promoted.

'Sport for all' is almost becoming a reality. The twentieth century saw the rise and development of new forms of employment in physical education and sport. State education authorities throughout the world, even in Islamic countries, are the principal employers in this area and are the biggest provider of training for teachers and supervisors. There are thousands of physical education teachers, trainers and instructors. A great diversification is taking place in the science and technology relating to physical activities, and there is no doubt about the enthusiasm that science and technology are generating in this area. There is a growing call for coaches and supervisors in many sports disciplines.

The century also saw the rise of new fields of specialization such as sports journalism and sports medicine, the sociology, psychology and history of sport, as well as sports law, the coaching and management of professional athletes, and the organization of physical activity and sport in thousands of sports centres and leisure parks.

### Sports culture, body culture: a new way of life

The way in which people relate to their body in industrial societies reflects a system of values resulting from a long and complex economic and cultural history. The era of religious taboos, said to have oppressed the body, would seem – contrary to all expectations – to have contributed to a growing interest in it, through a search for freedom. For various reasons, the Church, followed by the military and then doctors, teachers, those with a professional interest in physical activity and experts in various areas (food, clothing, entertainment) have taken the body as an object for study. Nowadays it seems that everyday life is built increasingly around this concern for the body. Bernard Xavier René makes the following observation: 'Among the phenomena that have marked the century we must include the exceptionally greater value placed on the bodily factor. Not only has it assumed an unprecedented status in our civilization, but we also have, as it were, more body than we have ever had ... The body's new status arose from a many-sided concern, branching out and increasing indefinitely, which has steadily extended to all strata of the population and increased with each generation, sometimes to an exaggerated degree, as the century has advanced. Having a body in this context means caring for one's body, attaching importance to it, giving it a value that goes beyond its material composition and changes its significance and its existence'.[54]

From the psychological and individual standpoint, the body is both external and part of ourselves, and it is through the body that our sensations, emotions, desires and pleasures come into play. Every individual perceives himself through his own eyes and through the eyes of others. As a result, the obese, the clumsy, the lethargic, the ill can expect humiliation – intended or not – and possible marginalization, since the perception of the body is more psychologically than biologically based and owes much to the hedonistic impulse.

Highly complex relationships between the individual, the body and the individual's image of the body lie behind certain conflicting, pathological impulses.

Individualism and narcissism rub shoulders. But it is a curious fact that the countries where the body is most lauded are also the ones where it is most badly treated, where the contrasting phenomenon of obesity is gaining ground with all its attendant risks. The United States, for example, the world's leading economic power, where the practice of individual or team sport is supposed to be most widespread, is also the country with the highest level of obesity (three people out of 10). Obesity and health thus represent the two extremes of this most complex body culture.

Is the individual giving up in the face of the enormous diversity of offers and opportunities, which range from simple walking to the practice of yoga and zen and encompass traditional gymnastics and all modern sports, mechanized or not, practised in winter or summer? Will recourse to the aesthetic surgeon's knife, the insertion of rings to regulate appetite, become the new way of life, even though physical exercise is quite sufficient to ensure good health and a good self-image? How then can we fail to ask whether we are making the right choices? How are we to ensure that our bodies are properly looked after?

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# 28

# EDUCATION

## *Lê Thành Khôi*

The twentieth century has been marked by a number of major political developments that have had a far-reaching impact upon education: the revolutions in Europe, Asia, Latin America and the Caribbean; the liberation of the former colonial countries; and the defeat of fascism in its various guises. After 1945, the West enjoyed a quarter of a century of unprecedented economic expansion, which enabled it to raise living standards in a lasting manner and to democratize its education systems. However, the twentieth century is also the century of scientific and technological developments that have revolutionized the theories, contents, methods and media of education. Inequalities nevertheless remain, and have even increased since economic growth has given way to stagnation and even to regression in some parts of the world. Many countries are burdened with unsuitable education systems which, accompanied by population growth, adversely affect their potential for development. At the dawn of the third millennium, the disintegration of moral, family, religious, and community values under the impact of so-called modernization has ushered in a reign of confusion and uncertainty.

## THE FACTORS OF CHANGE

### The political context

The political sphere can never be dissociated from the social sphere, since it involves the interaction – often accompanied by conflict – of social, economic, religious and other groups which, depending on the nature of the power in place, favours particular classes over others.

The twentieth century started with the Mexican revolution (1910), which was basically an uprising of millions of peasants who had been deprived of their land by the dictatorship of Porfirio Díaz. José Vasconcelos, who was Minister of Education from 1921 to 1924, launched a 'cultural crusade' aimed at teaching young people and adults to read and write, spreading the Spanish language among the Indian population, publishing reading primers and textbooks, and greatly increasing the number of libraries. In 1928, the proportion of children receiving primary schooling in Mexico stood at 46 per cent compared with 27.4 per cent in 1907. It was also at the instigation of Vasconcelos that a 'matrix of mythical images of the nation aimed at enlightening social cadres' came into being: the painters Jose Clemente Orozco, Diego Rivera and David Alfaro Siqueiros decorated schools and public buildings with murals addressed to the people in a bid to educate them in the spirit of the revolution, while at the same time enabling them to discover their Indian roots. However, the 'socialist education' written into the Constitution in 1934 came up against strong resistance from the Catholic Church and a number of intellectuals, and was abandoned in 1946, at the same time that the official political party assumed the name Institutional Revolutionary Party, which signified the end of the revolution.

The Marxist-Leninist revolutions have had a more lasting impact. For many decades, the Russian Revolution of 1917 sustained the hopes of millions of men and women all over the world, while inspiring other revolutions in both education and politics. These 'revolutionary' principles included: mixed, polytechnic public education, continuing uninterrupted from the primary to the higher levels; equality of the sexes; and the right of people to use their own language. Although already applied in the United States, this was the first time in Europe. The Cultural Revolution was an integral part of the political revolution. Lenin said that: 'the victory of the revolution will be consummated only through school … Our work in education consists in overthrowing the bourgeoisie and we state loud and clear that school which is detached from life and politics is a lie and a hypocrisy.' However, he set out to preserve those aspects of bourgeois culture that were 'good', especially science and technology. Illiterate people were not going to develop agriculture and industry. 'People can become Communists only after they have enriched their minds with all the wealth created by humanity.' Workers' universities (*rabfak*) were created for training young workers and peasants. At the same time, a vast literacy campaign was launched with the aim of teaching all people, aged 8 to 50, to read and write either in Russian or in their mother tongue. Scripts were created for peoples whose languages were not written and the illiteracy rate, which had stood at 66 per cent

in 1917, fell to 43 per cent in 1926, and to 11 per cent in 1939. Free compulsory education was introduced in 1930 for a minimum period of four years (seven years in cities and industrial regions).

The first five-year plan (1928–32) linked economic forecasting and the training of specialists for the first time. Planning, which became progressively more elaborate, adopted a twofold approach: planning of general education in accordance with population growth forecasts and the length of compulsory schooling (which was raised to eleven years in 1984), and planning of higher and specialized secondary education in accordance with the needs for skilled personnel. Rapid expansion of education at all levels was ensured through political commitment and planning. In 1914, the Russian Empire had 9.7 million schoolchildren and 127,400 students out of a population of 265 million inhabitants, or 48 students (almost all Russian) for every 100,000 inhabitants. In 1990, this figure had risen to 1,867 students per 100,000 inhabitants, while school enrolment ratios stood at 89 per cent for the 6–11 age group, 96 percent for the 12–16 age group, and 27 per cent for the 20–24 age group. One particularly remarkable feature was the massive strides taken by science and technology in certain fields, as evidenced by the launching of the Sputnik satellite in 1957 and Yuri Gagarin's space flight in 1961.

All the revolutions that claim to have their roots in the socialist ideal have one feature in common: the efforts they have made in education and literacy. In fact, the latter's purpose is not only a social one. It is above all a means of mobilizing the population for revolution and national construction, while at the same time people are learning to write and read political slogans.

In Viet Nam, immediately after the revolution of August 1945, Ho Chi Minh called on the population to accomplish three fundamental tasks: overcome famine, foreign aggression, and ignorance. These were interdependent: as long as a nation is underdeveloped and uneducated, it is an easy prey to imperialism. Conversely, imperialism is responsible for perpetuating underdevelopment and lack of education. A country cannot bring about its economic and social revolution without promoting a cultural revolution. National and social revolution is the driving force behind the development of education, and education in turn strengthens revolution, since education increases the level of political awareness of the people and their participation in the revolution. Peasants learn to read through directives and political and military explanations. When the agrarian reform was launched in 1953, literacy was linked to the class struggle in rural areas. It set out to instil in the peasants an understanding of how the social and economic structure was at the root of their poverty and what advantages they would derive from overthrowing the landowners. In the north of the country, illiteracy was virtually eradicated in 1958, and three years later the revolution brought literacy to the mountain areas inhabited by minority peoples.

Likewise, in 1960, the literacy campaign in Cuba was seen as a wide-ranging revolutionary movement. Some 268,000 young volunteers, workers, students and primary school teachers provided literacy training for more than 700,000 men and women in the space of one year. They had a textbook entitled *Alfabeticemos*, which, after an introductory section, set out 24 themes – covering the revolution, the land and the economy, imperialism and democracy – in conjunction with those in the primer

*Venceremos*. The 15 lessons in the primer also dealt with the problems of the revolution, illustrated by photographs, which helped learners to grasp the spirit and importance of the lessons. The literacy effort was backed up by a propaganda drive that had three main objectives: motivating illiterates by using all possible means, such as the mass media, festivities, demonstrations and awarding diplomas; creating a movement of opinion in order to encourage the largest possible number of persons to enlist as voluntary teachers; and popularizing the broad lines of the campaign. Illiterates were not the only people to receive political instruction through learning to read and write. Literacy workers were also trained; coming generally from the urban middle classes, they gained closer knowledge and understanding of workers and peasants.

When, after the fall of communism in Europe (1989–90), the countries which had adopted that system changed over to a market economy, the impact on education was felt soon thereafter: the polytechnic principle (the linkage of study and productive work), planning and free education were all abandoned (except at the primary level); private and denominational schools rapidly sprang up; and education systems, programmes and teaching methods were reformed, often modelled on those of the United States or Western Europe.

In Iran, the Islamic revolution of 1977–79 stressed the cultural identity of the country, which it said the Shah's regime had corrupted by its policy of Westernization of lifestyle and rapid growth, a policy that had above all profited a minority of privileged people. The Islamic revolution set out to restore the purity of Shi'a Islam in the interpretation given to it by the Ayatollah Khomeini, the guide (*imam*) of the Republic. All aspects of life were accordingly redefined, and the education of younger generations was given special attention. Teaching contents and methods were redesigned; in social science disciplines (history, law, economics, sociology), especially at university, teachers had to take an oath of loyalty and were closely supervised; and co-education was banned (which led to a decline in the enrolment of girls in rural areas lacking in women teachers). Action in the formal education system was heavily backed by propaganda on radio and television, in films, books, posters and murals, which extolled obedience to the Law represented by the government and assimilated any dissension to a revolt against the will of God. Counter-revolution took the opposite direction: since education is a strategic institution, previously existing structures need to be destroyed in order to conform to the new ideology.

In Chile, the military *coup d'état* of 11 September 1973 marked a break with the democratization movement pursued under the Christian Democrat government and subsequently that of Popular Unity, in which education was characterized by the growing participation of the middle and lower-income classes, giving rise to greater social mobility. Universities performed a critical function over and above their traditional educational role, and grassroots education was developed in urban neighbourhoods, chiefly under the impetus of the trade unions. The military government, which was supported by the bourgeoisie, drew on Christian and national values to promote a neo-liberal policy. The objectives of education were to instil love of the homeland and the family and to subscribe to the concept of the unity of the nation and obedience to the state. Teachers and students and programmes and textbooks suspected of

spreading subversive ideas were accordingly 'purged', and school and university establishments came under the strict control of the military authorities. The state only maintained responsibility for basic education, in which children learnt their civic duties. Access to other forms of education was to be a privilege, since it had to be paid for; in other terms, such education was privatized in accordance with market laws. The outcome was a sharp decline in enrolment growth ratios. The crackdown on trade union activities led to the virtual disappearance of 'open' grassroots education. However, this continued in a clandestine and informal form, since the dictatorship was unable to stifle the love of freedom, especially when its neo-liberal policies resulted in the decline of many industries and in rising unemployment and extreme poverty among the most underprivileged sections of the population.

In Western Europe, the First World War had a profound impact on people's minds. Democratic ideas progressed, calling into question a double track education system – one for the masses and the other elitist. Yet, the opposition of conservative forces and the economic crises of the 1920s and 1930s put a halt to this hope for democratic change. Several countries in Europe established authoritarian regimes, which ruled through totalitarianism. In Italy from 1923 onwards, the Fascist regime made the Catholic religion the basis of primary education again, increased the selectivity of secondary schools, abolished transfers between general and technical education, subjected the entire system to strict supervision, and compelled young people to engage in paramilitary training. In Germany, Nazism was even more systematic. For the first time in the history of that country, education was centralized, and syllabuses were revised to give a leading place to the 'science of race', books were banned and burnt, and Jewish teachers and other teachers who refused to take an oath of loyalty were driven out. In Japan, militarism spread ultra-nationalism in schools by instilling in them the 'path of the subject', in other words loyalty towards the emperor, the incarnation of the nation. Defeat, however, was to sweep these regimes aside.

The year 1945 was the starting point for the independence of the formerly colonized countries. In every instance, colonial education had had a twofold purpose: first, to train auxiliary middle-grade personnel for government services and the economy, and second, to extol the civilizing mission of the metropolitan powers and demean indigenous cultures in order to make their subordination more palatable. However, colonization itself, through its own workings, created the elements that were to oppose it. In the first place, it had to contend with the at times passive, but more generally armed, resistance led by the traditional elites. With the spread of the colonial administration and capitalist exploitation, new classes came into being, such as the landowning, industrial or commercial middle class, the proletariat of factories, plantations and mines, and office workers and intellectuals. The Second World War made colonized people understand that European domination could only be defeated using Europe's own means. From Asia to Africa, independence would be won by peaceful means in some instances and by force of arms in others (1945–75).

The outcome everywhere was a spectacular growth in education, which was regarded as a *sine qua non* for satisfying the aspirations of peoples, consolidating independence and increasing economic potential. In the countries of Asia,

which had long had a written literature, national languages (such as Vietnamese and Bahasa Indonesia) replaced the foreign languages imposed by colonization, although some countries, such as India, the Philippines and Malaysia, more or less kept the foreign language in higher education. In Africa, such changes were more difficult to bring about, owing to the absence of written traditions (the local languages involved were progressively Romanized), the large number of different ethnic groups and, in many instances, the limited number of speakers, which increased the cost of preparing and producing textbooks and training teachers, quite apart from the political problem posed by the adoption of a 'national' language in a multi-ethnic state. This is why the countries south of the Sahara kept the languages of the former colonial powers as a vehicular language, while nevertheless more or less 'Africanizing' the teaching of literature, history and geography. The countries of the Maghreb adopted a similar approach, although Arabic was introduced in the first years of schooling.

## Population

Through its growth rate and age and gender distribution, population changes influence school and university enrolment numbers as much as government policies and family demands. In this respect, there is a fundamental difference between the industrialized and less affluent countries.

In Europe, universal schooling grew progressively with industrialization and urban development, at a time when population growth did not exceed 0.5 per cent per year. In the United States, in spite of the massive waves of immigrants, it took place more quickly (except for African-Americans and Native Americans) on account of economic growth. In the first half of the twentieth century, the declining birth rate in these countries gave rise to stagnation, and indeed to a reduction, in enrolment numbers in the primary education system, in spite of the extension of compulsory schooling. After 1945, a short-lived demographic boom subsequently gave way to a further decline in the birth rate, which is now less than 12 per 1,000, so that the natural growth rate is fluctuating around 0.6 per cent. These populations are 'mature', in other words the proportion of old people (65 years of age and upwards), representing some 20 per cent, exceeds that of the school-going population in the 6 to 14-years age-group, which stands at less than 14 per cent.

After the Second World War, 'democratization' was a highly topical issue. The *Universal Declaration of Human Rights* (1948) included the right to education, as did the *Declaration on the Rights of the Child* (1959). All the industrialized countries tried to effect this right, at least in quantitative terms, assisted by unprecedented economic growth for a period of 25 years (1945–70). However, chances were still not all equal at the pre-school level. In 1990, all children aged from 3 to 5 years attended nursery school in Belgium, Denmark, France and Ireland, while between 50 and 60 per cent attended in the United States, the United Kingdom, Japan, Greece, Spain, Portugal and Switzerland, and even smaller numbers attending elsewhere.

Compulsory schooling usually begins at 6 years of age, and sometimes at 5 (as in the Netherlands, the United

Kingdom, Israel and New Zealand) or 7 (in Scandinavia and Switzerland). Primary schooling ends at age 11 or 12. It is followed by a cycle of observation and then streaming (France) or, as practiced in Sweden, primary school is attended for nine years, with optional subjects in the last few years. In other countries, the break comes earlier, at age 9 or 10. This is true of Germany where, after four years of primary school, the pupils are streamed – in principle according to their level, but in reality according to their social background – either into the *Gesamtschule* (and then into the *Gymnasium* and university) or else into the *Realschule* (and middle-grade jobs) or the *Hauptschule*, in other words apprenticeship. Integrated schools are rare.

The demands of families, and especially the growing awareness among people from modest backgrounds that instruction is a factor in social advancement, have been largely instrumental in the extension of compulsory schooling and of secondary and higher education. However, inequalities have not disappeared, especially those suffered by minorities, to which we shall return later.

Since 1970, economic growth has slowed and funding for public education has been cut back. This situation coincides with the decline in fertility and population growth: if this trend continues, birth and death rates will come closer together and population growth will become stationary in 2025. Since 1976, school enrolment numbers at the primary level have no longer been increasing in most industrialized countries and have declined slightly at the secondary level, but are progressing in higher education due to demographic and social factors.

The reduction in enrolment in compulsory schooling will have an impact on the demand for teachers. Some countries will be tempted to reduce the number of teachers and thereby make savings. Rather than expose them to unemployment, others will see an opportunity for improving the quality of education by reducing the pupil/teacher ratio. Still others may redirect the 'surplus' into non-formal education, especially as part of lifelong education.

On the other hand, the growing number of old people, accompanied by a reduction in working hours, a lower retirement age and an increase in free time means that there is a greater demand for cultural education and leisure-time activities from this group. Adult education has been developed to cater to this need, as well as to provide refresher courses and training for workers or young people who have an inadequate educational background. All countries have taken steps in this area, especially the United States, where more than 60 million people, one-third of the population aged 17 and upwards, take part in different education and training programmes mobilizing schools and universities, museums and libraries, and vocational associations and trade unions.

By contrast, in the less developed countries, population growth is still high on account of a declining death rate and a continuing high fertility rate. Sub-Saharan Africa, while being the poorest continent, also has the highest population growth rate, at 2.9 per cent since 1970, and the only one not to decline in the short term. The other regions are in a process of demographic transition, in other words their birth rate has declined over a period of twenty years, with annual population growth falling from 3 to 2.5 per cent in the Arab States, from 2.2 to 1.8 per cent in Latin America and the Caribbean, and from 2.0 to 1.6 per cent in Asia. However, Asia's population accounts for 60 per cent of the world total, which is a considerable absolute figure. In the developed countries, the population growth rate has fallen from 0.7 to 0.4 per cent. Higher population growth means a greater proportion of the population is eligible for schooling: in the developing countries, the 5–14 year-age group accounts for 22 per cent of the population compared with 14 per cent in the developed countries. The education cost burden is accordingly heavier, especially since it has to be financed by a lower proportion of the active population: the 15–64 year-age group accounts for 61 per cent of the population in the developing countries compared with 66 per cent in the developed countries. In other words, 1,000 members of the active population carry the burden of educating 360 children in developing countries compared with only 210 children in the developed countries. The low level of income per inhabitant in developing countries compounds the influence of the population factor.

Another phenomenon whose effects are creating greater difficulties for education in developing countries is the rural exodus. In the industrialized countries, urbanization went hand-in-hand with economic growth, whereas in developing countries it has preceded economic development. In the latter case, urban growth has increased twice as quickly (5 to 6 per cent per year) as the population. This phenomenon is particularly serious, since schooling acts as a stimulant for the rural exodus: young people go to the cities to continue their studies; they have high aspirations and cannot bear the constraints of a village environment, which they regard as being backward. However, their departure deprives rural areas of a large part of their productive resources, since the only people left are women and old people. In the cities, many young people cannot find work and will end up in unemployment or delinquency.

Today, more than 70 per cent of the world's population are living in cities. Urban development is very rapid in Latin America, followed by Asia and, to a lesser degree, by Africa. As slums and shantytowns proliferate (one-third of all city-dwellers already live in them), and housing estates spread, this will create difficult problems for governments in providing young people with the education, work, social and cultural services and leisure time activities to which they are entitled.

All these factors have created an awareness of the need for better understanding population factors with a view to improving the quality of life of individuals and communities. However, perceptions may differ for all sorts of reasons. The first thing that has to be understood is that population growth is both a factor in economic growth and an impediment to that growth. There is too great a tendency to give prominence to the negative aspects of population growth. It is true that when the population gets too large compared with the resources available or is increasing too quickly, the *per capita* income decreases, education costs rise, job opportunities are reduced, urban problems grow worse, and the environment deteriorates. However, population growth is also a source of labour, work and production. The historical development of Europe, the United States and Canada bear witness to this. At the present time in Africa, the economy is stagnating since there is not sufficient labour to develop the land, with young people who have attended school deserting the countryside and leaving only women and old people behind.

Approaches may vary, however. Some countries, for cultural or religious reasons, rule out sex education and the

idea of birth control, and limit their efforts to describing the negative impacts that population growth can have on the quality of life. Curricula and contents also vary depending on the different types of audience, whether they are children, young people or adult men and women in rural or urban areas, or depending on whether the mode of education is formal or non-formal.

Naturally, education alone cannot resolve all problems. It has to be supported by measures in other fields: for example, is it possible to learn to wash oneself if there is no water, or not to strip woodland if the only source of energy is firewood? In the first case, the answer may be to dig wells or bring water from mountain areas by a system of canals (such as the *qanat* in Iran), and in the second case to use solar energy.

The destruction of the environment is not caused only by the number of people (in the South) but above all by industry and automobiles (in the North). What is more, in the North, the Netherlands, where the population density is 350 inhabitants per sq. km, suffers less from pollution than the United States, with its population density of only 22 inhabitants per sq. km. Barry Commoner compiled a set of significant statistics (quoted in the journal *Population*, May–June 1972) on the increase of pollutants compared with that of the population. Over the period 1946–68, growth in the production of non-organic nitrate fertilizers, insecticides, phosphate-enriched detergents, tetraethyl lead and nitrogen oxides (in the automobile industry), and plastic bottles rose from 267 to 846 per cent, while population growth varied only between 30 and 42 per cent.

Many economists in the North and South alike have pointed out that the rich countries, with one-fifth of the world's population, consume more than two-thirds of its resources, a considerable part of which they waste. These resources are taken not only from their own countries but from those of the South as well. For instance, soya bean exports from Brazil (for feeding European cattle) and meat exports from Guatemala, are to the detriment of small farmers, and to the advantage of the local landowning minority and the rich in Western countries: they work hand in glove through the intermediary of multinational corporations in the agro-business sector. Hence, it is often the poor who feed the rich. A genuine international or internationalist education effort should make public opinion in the West aware that it cannot preach in favour of a reduction in economic growth in the South without calling for a change in the lifestyle in the rich industrial countries, especially since a balanced diet is more conducive to good health: Europeans consuming 100 kilos of meat a year would feel much better if they consumed only 30 kilos.

One last problem – which is no less important than the others – needs to be mentioned. This is the co-existence, owing to historical or economic factors, of a large number of ethnic groups in countries where, during the long period of industrial growth following the Second World War, enterprises imported cheap labour from the less developed countries. In Western Europe, for instance, immigrant workers and their families now represent some 15 million people, to which waves of political refugees from Asia and Africa should be added. The proportion of foreign communities as a part of the total population varies from 3 per cent (Norway) to 15 per cent (Switzerland), with Germany and France occupying a midway position (6 to 7 per cent). Regardless of whether the minorities are nationals or immigrants, the attitude of the dominant majority, as reflected in its education system, can spark off reactions going as far as open revolt in cases where they no longer accept inequalities and discrimination. However, there are also instances of antagonism between the minorities themselves for political, economic and religious reasons. Moreover, the integration of Europe is increasing the mobility of people in this part of the world and is making it increasingly a multicultural society, second only to the United States. Regardless of its origins, pluri-culturalism can be a source of both enrichment and tensions, due to differences and prejudices of an ethnic, linguistic, cultural, religious or other nature. A genuine intercultural education policy is becoming an increasingly compelling requirement; thus far education policy has concentrated on assimilating the children of immigrants.

**The economy**

Economic development is essential for providing the physical and financial resources required for the development of education which, in turn, is vital for training the managers and workers needed for the different economic sectors. Conversely, all other things being equal (such as no foreign assistance being provided for the poor countries), economic stagnation or even regression entails difficulties for education.

For twenty-five years after the Second World War, the West enjoyed considerable growth, which resulted in expenditure on education rising faster than GDP and in an increase in school enrolment at all levels (this increase was also boosted by the population boom). In East and West alike, this period was marked by the rapid strides made in economics of education, educational planning and the theory of human capital.

The Soviet economist Stanislas Strumilin was rediscovered. He had been the first, in 1924, to evaluate the profitability of education with a view to guiding planners in their choices. By comparing the wages and productivity of different categories of workers according to their level of instruction – with due regard to their age, occupational experience, qualifications, and so on – he came to the conclusion that education, even of the most elementary kind, made a much greater contribution to economic development than a long period of factory apprenticeship. By increasing the efficiency of workers, it increased the national product, and the expenditure incurred on public education was more than recovered. Slightly later in the West (1935), J. Walsh went back to the concept of capital put forward by William Petty as early as the seventeenth century, and applied it to individuals, whose 'value' was equivalent to the actualized sum total of their earnings during their working lives, which were in turn derived from their level of instruction.

The launching of Sputnik in 1957 had major implications for education. It was interpreted as resulting from the rapid scientific and technical headway the Soviet Union had made through the effort it had invested in education and research. In the United States and Europe this event triggered a whole series of studies on the human factor in development, this term including education, health and organization. The theory of human capital took shape in the United States. Education was not only a consumer item, as it was considered until then, but an investment, since it generated for

individuals benefits that were higher than the costs they incurred, including shortfalls in earnings. Since income proportional to the levels of instruction is a reflection of productivity and society is a sum of individuals, the increase in the stock of instruction is bound to foster economic growth and social equality. Various authors have calculated the contribution of education to the rise in GNP, and this has proved to be higher than that of physical capital.

The theory accordingly legitimized the increase in expenditure on education and in enrolment at all levels, especially in secondary and higher education. In turn, the 'school explosion' caused educational planning to make rapid strides. Formerly confined to the socialist countries, educational planning spread to the West after 1945 owing to the needs of reconstruction and, subsequently, modernization and international competition. In education, planning was a response to increasing enrolment, which followed the population boom after the end of the war, the extension of compulsory schooling, and the growing awareness of families that education fosters social advancement and mobility. In addition, there was the concern to meet the growing demand for skilled personnel. International organizations, such as the OECD (Organisation for Economic Co-operation and Development), the United Nations, and UNESCO in particular, spread the idea of planning in the West and in the world generally. Unlike the mandatory planning in socialist countries, it was merely indicative elsewhere. Whether mandatory or not, planning was accompanied by maps showing the distribution of schools, with a view to reducing regional inequalities. School architecture was renovated so as to serve teaching methods centred on children rather than imposing a single model for everyone. Planning spread from formal school education to vocational training, adult education and non-formal education.

However, the rise in oil prices in 1973, followed by other crises, had lasting effects. With a few exceptions it led to the decline or stagnation of the share of public expenditure devoted to education relative to GNP.

The most serious phenomenon has been the overall increase in unemployment, which has affected women more than men, young people more than adults and those who only had compulsory schooling more than others. On the average, employment rates rise with educational attainment.

In 2002, in most OECD countries, the employment ratio for graduates of tertiary education is markedly higher – around 5 percentage points on average – than that for upper secondary graduates (with the exception of Mexico and New Zealand). The gap in male employment ratios is particularly wide between those with and those without an upper secondary education. Among females, the difference in employment ratios by level of educational attainment is even wider. Employment ratios for females with lower secondary attainment are particularly low, averaging 49 per cent over all OECD countries.[1] The crisis also led to some disenchantment with planning and the collapse of the theory of human capital.

In the South, the most severely affected region is Africa, which is heavily indebted and whose economy is not taking off. The newly industrialized countries of Asia and Latin America, however, are more fortunate, although the drive for profit can lead to a neglect of education, which shows a lower return than industry or trade. In China, for example, the share of GNP devoted to education fell from 2.5 per cent in 1980 to 2.3 per cent in 1991, the same as in 1996. Owing to population growth, the problem of unemployment is bound to grow worse. The number of people who are unemployed or underemployed is currently estimated at 600 million worldwide. The International Labour Organization considers that, in order to absorb unemployment, it would be necessary to create one billion jobs, including 880 million in the developing countries. Because of unemployment, there is a loss of interest in school (Plate 162). In many countries, parents take their children out of school in order to put them to work in the fields, in workshops, in small businesses, and on the street.

The unemployment crisis has triggered a series of reforms in secondary and, above all, higher education. These tend to diversify the streams and types of schools between which transfers are made easier, in order to take account of the different capacities of pupils, and to cater to the different needs of the economy and society. Often, short higher education courses have been introduced with the aim of preparing students for a particular occupation at the level of technician, production engineer, or primary or lower secondary teacher. In order to enable students to combine their studies and their occupation, many universities have established flexible arrangements for admission, class attendance, and awarding diplomas, either by establishing a system of credits that can be capitalized or by making widespread use of correspondence and radio or television courses (the 'Open University').

The decline in public expenditure for education has generally been offset by the increase in school and university fees and the development of private education, which is particularly widespread in the United States, Germany and Japan. In addition, universities are encouraged to secure fresh resources through research contracts with industry and special training programmes. Savings are made by reducing personnel or recruiting part-time teachers, at the risk of reducing the supervision ratio (in France, the student/teacher ratio rose from 20:1 in 1975 to almost 25:1 in 1991, and in Austria from 8.6:1 to 15:1). Efficiency is sought through better management by analysing the unit costs for each level and type of education; by making full use of premises and equipment; by encouraging preventive maintenance, thus saving on later repairs by not waiting for structures and equipment to deteriorate; by using materials

*Table 12* **Public expenditure on education in developing and developed countries** *(Percentage of GNP)*

| Region | 1980 | 1991 | 1997 |
|---|---|---|---|
| Developing countries: | 3.9 | 4.1 | 3.9 |
| Sub-Saharan Africa | 5.2 | 4.6 | 2.9 |
| Arab States | 4.5 | 5.5 | 5.4 |
| Latin America and the Caribbean | 4.1 | 4.2 | 4.6 |
| East Asia/Oceania | 2.8 | 3.4 | 2.3 |
| South Asia | 4.1 | 4.1 | 3.3 |
| Developed countries | 5.4 | 5.3 | 5.1 |

*Source:* UNESCO, 2000, *World Education Report 2000*, p. 118.

and techniques of local origin in order to reduce construction and fitting-out costs and involve the community; and lastly, by diversifying financing resources, such as by taxing companies and completely or partly doing away with free education and scholarships. In the former socialist countries, only primary or compulsory education has continued to be free, and secondary and higher education now have to be paid for: so much for the market economy.

The oil crisis has added another concern common to developed and developing countries alike: that of the environment, or rather of the ecosystem, in other words the relationship between people and their surroundings. Although the perception of industrial and urban disamenities is not recent, it was not until the 1970s that a new ecological awareness manifested itself in the developed countries and more recently in the developing countries. There is the view now that such disamenities are not incidental to growth, but its unavoidable consequences, which could lead to the destruction of the ecosystem. However, the pursuit of unlimited growth, centred on the unchecked exploitation of nature, is not independent of a certain conception of the world that sees people as the 'masters and possessors of nature', and nature as a machine that can be manipulated by the power of the mind. Education contributes to this attitude: whether it is formal or non-formal, it extols the powers of reason and the pre-eminence of action as fundamental values of a society assimilated to a work organization; it propagates the religion of production and consumption as criteria of civilization and well-being.

In 1972, the Stockholm Conference mooted the idea of 'environmental education' addressed to all, young people and adults alike, in order to make them aware of their responsibility for protecting the environment. It was not envisaged as a discipline, but as an interdisciplinary theme bringing together both the physical and biological aspects of the environment, as well as its economic and socio-cultural aspects, since people form part of the ecosystem. It goes beyond the traditional 'study of the environment', which, since Locke and Rousseau, has endeavoured to take account of children in their environment, with a view to shaping their personalities. Added to this concern is that of developing in both children and adults a planet-wide awareness and responsible attitude towards the management of the environment, the source of all life on earth. The Belgrade Conference (1975) listed several objectives for such an education, including: instilling an awareness of the environment in individuals and groups; prompting them to acquire the behavioural attitudes, skills and capacity to evaluate the training measures and programmes; and involving them in problem-solving. This is therefore not a new 'subject', but 'a dimension and permanent function of education', as defined by the Tbilisi Conference (1977), bringing together biology, history, geography and the economic and social sciences, requiring active methods and working in groups and in the field.

The Rio Conference (1992) took up all these themes by stressing action and respect for and protection of the environment, and the need for continuing education 'from nursery school to faculty' by linking such education to the idea of 'sustainable development'. UNESCO and UNDP (United Nations Development Programme) have held a large number of symposia, produced the review *Connections* and guides for the preparation and evaluation of curricula, launched pilot and experimental projects, and assisted in training or providing refresher courses for teachers. A hundred or so countries have included environmental education in their formal and non-formal teaching programmes. On the whole, the activities are still limited, since this form of education is not compulsory and its interdisciplinarity is difficult to introduce in practice. At the present time, schools have less impact than the extracurricular activities by associations, natural parks, local communities and ecological movements.

## Science and technology

The twentieth century is the century of science and technology, two areas in which constant progress has been made, especially since the Second World War, regardless of fluctuations in the economy. The two give each other mutual support, since the second is an application of the findings of the first, which is governed by the technologies made available to it.

The word science has to be taken in its broadest connotation, so that it includes not only the exact and natural sciences but also the human and social sciences, especially since these have a direct impact on education. Since the end of the nineteenth century, teaching has developed much more rapidly than in all earlier periods, when it was considered as an 'art' and was the subject of philosophical speculation rather than objective studies. This new aspect is characterized by the increasingly large place that 'science', in the measurable and experimental sense of the term, has come to occupy in teaching. In addition, with the growing complexity of phenomena, research, which was long confined to schools, has been broadened to include everything taking place outside them and is having an impact on training. This is how the 'educational sciences' came to be developed: some of them deal with the general factors influencing education (philosophy, history, anthropology, sociology, demography, educational administration and planning) while others deal with its inherent processes (biology, psychology, linguistics, teaching methods). Comparative education is not a discipline but a field of study, which is concerned with both external conditions and internal workings, and adopts a particular approach according to the subject of the research.

Educational psychology first emerged at the end of the nineteenth century with William James (1842–1910), a pragmatist who considered pupils as being 'machines driven by associations' and laid stress on interest as the driving force behind educational advancement. The intelligence test method was founded by Binet and Simon (1905) and developed by Terman and Thorndike with the aim of guiding pupils during their compulsory schooling and, on its completion, to select individuals and give them vocational or military training. The same period saw the emergence of what is currently known as 'new schools' or 'new education' in Europe, and 'progressive education' in the United States. In opposition to the bookish and intellectualist tradition, this new approach required that education of the mind be accompanied by that of character, taste and the body, in a twofold individual and social perspective. The activities of children had to be encouraged in all their forms so that they would participate in their own training and the 'master' would give way to the 'educator', who would act towards them as a guide respecting their personalities, capable of

organizing both group and individual work, laying stress on cooperation rather than competition, on success rather than failure, all in a favourable and suitably equipped school setting. The most influential writer of the first half of the century was John Dewey (1859–1952), who is best known for his phrase 'learning by doing'. In fact, Dewey advocated the combination of play and intellectual and manual work in joint experiments, so that schools would train children in the qualities of initiative, responsibility and adaptability which they will need later in life. Dewey conceived of school not as serving individualist purposes but social ends. Like society, it had to be democratic. However, children were not adults. It was necessary to foster their current interests, their *joie de vivre*, their spontaneity, and the spiritual and moral fulfilment of their personalities, rather than impose utilitarian objectives on them. 'Education is a life process not a preparation for life' (Dewey, *My Pedagogic Creed*).

Dewey influenced Ovide Decroly, who, wanting 'a school for life through life', created the Ecole de l'Hermitage near Brussels in 1907. The school was not expected to prepare children for adult life, but represented a living environment, which would give expression to all their faculties. Because Decroly entered into contact with reality in global terms, he advocated the global method for reading and writing, as well as for all-round psychological training. Teaching was not by subjects but according to centres of interest, which grouped and ordered knowledge likely to arouse the curiosity of children. Each centre was tackled from different angles: observation and measurement, association in space and time, expression in all its forms.

In the same year, Maria Montessori opened the Casa dei bambini in Rome. Combining sensualist hypotheses and the ideas of child observation, freedom and activity, she developed appropriate teaching materials, which, through successive exercises performed in an atmosphere of affectionate relations with the educator, were aimed at the children's motive and sensory training. Montessori left no scope for children's spontaneity, and she closed the classroom to any intrusion from life outside.

The influence of Freud (1856–1939) made itself felt mostly in the years after 1950. His conception of education was derived from his theory of individual psychological development. This is above all governed by emotional development, which is itself governed by drives, the main one being sexual. However, the pleasure principle, which regulates us, comes up against the reality principle because life with others and culture require the regulation of human relations. Educators therefore have to teach children to control their instincts and hence find an optimum between 'the Scylla of inaction and the Charybdis of prohibition'.

In the case of Piaget (1896–1980), education entailed adapting individuals to the surrounding social environment not by teaching them ready-made truths, but by making them understand and learn through action and experimentation in accordance with the laws of mental growth (Plate 163). Piaget distinguished three developmental stages whose order of succession are constant: sensory-motive intelligence in the course of the first two years; concrete operations from 2 to 11 or 12 years; and formal operations from 11 or 12 to 16 years. The move from one stage to the next takes place through assimilation of new objects and the adaptation of action to particular conditions, resulting in equilibrium. Teachers have to guide and constantly stimulate the activity of children, and it is this activity alone that can 'lead to intellectual autonomy'. The pivot is motivation, and without interest, there can be no motivation. Two issues in this theory have given rise to discussion.

The first concerns the role of language in cognitive development. In Piaget's view, children can acquire words without necessarily acquiring logic. On the other hand, according to J. S. Bruner, it is not action but language that develops intelligence, since it makes it possible not only to communicate but also to take the experience into account. A third hypothesis is possible: the existence of a factor that would be the basis of both cognitive and linguistic development.

The second issue concerns the universality of the stages. Considerable intercultural research has confirmed Piaget's sequence, although at the same time it has also shown the importance of the economic and cultural factors disregarded in his theory, such as urban development, cultural integration, schooling, and the physical and intellectual environment. For instance, nomads need spatial concepts, while sedentary farmers give preference to those involving conservation, quantity, weight and volume, because they have to store and trade in their produce. The Arctic Inuit are quicker to acquire the notion of horizontality than the Ebrie of West Africa, while the contrary is true of conservation, with the Australian aborigines occupying a midway position.

Lastly, the performance of the subjects tested may not reflect their skills on account of the conditions of the experiment and the structure of their thought, because each culture places a different value on a particular concept. Piaget gave prominence to formal intelligence, which is bound up with scientific rationality and Western capitalism. This is not the case with other cultures. An uncritical application of these criteria would amount to ethnocentrism.

Schools started to use photographs, films, recordings, records and radio, which was followed, after 1945, by television, teaching machines and computers. The audio-visual media first served as a teaching aid in order to provide additional documentation and create or stimulate the interest of pupils. They can reach a considerable public; the Open University in Britain, which was opened in 1971, has been emulated in many other countries as a way of giving educational access to isolated or disabled people (as in Australia) or to provide more flexible work and study opportunities. According to research, pupils learn more with audio-visual media than with audio or visual media alone, for example when film is associated with other activities (the compilation of documentation in preparation for the film projection, subsequent discussion and supplementary information). The limitations originally imposed in respect of timetables and the continuity of exposition have been removed by tape and video recorders, which have improved learning processes, especially of modern languages, musical studies and forms of oral expression. Video plays an important role in teacher training (micro-teaching), medical education (transmission of surgical operations) and creation (video clips). The audio-visual media are also the subject of teaching since, as stated by the International Commission for the Study of Communication Problems, 'information is easily corrupted into the dissemination of half-truths and even falsehoods, persuasion into manipulation and propaganda'.[2] The role of

teachers is to help develop the critical thinking of their pupils by teaching them that an image is never neutral, any more than a word.

Teaching machines were introduced with programmed education (theoretically, such education can manage without the machines and can use 'scrambled books' instead, but the results are not as good). Teaching machines draw their inspiration from behaviourism and their driving principle is reinforcement, in other words the immediate reward that increases the activity and motivation of the learner. The programmes, which may be 'linear' or 'ramified', are applied in the teaching of mathematics, the sciences, and modern languages, and in vocational training.

Information technology, the latest innovation to influence teaching methods, makes possible not only the remote transmission of knowledge, but also to process, store and distribute it, thereby stepping up intellectual activity, especially since the arrival of the personal computer. Computer-assisted teaching (CAT) has been used above all as a tool for teaching and learning. The weakest pupils seem to benefit the most from this, but the higher the level of education (from primary to higher education) is, the smaller seems to be the benefit that can be drawn from CAT. If the progress made with CAT is far from living up to expectations, this is because there is no theory of learning to explain how computers can or cannot foster the acquisition of knowledge. What they can already do is to adapt teaching to the needs of individual pupils, to their working pace, to the level of their knowledge, and to their cultural backgrounds. Some countries are experimenting with educational software using artificial intelligence processes capable of interpreting, evaluating and correcting the replies of pupils and putting forward personalized learning strategies.

As an academic subject, information technology (IT) was, depending on the country, introduced some 20 to 30 years ago in universities and institutes of technology, and more recently in general secondary education and even primary education. Increasingly the view is that information technology forms part of the basic knowledge that children should learn during their compulsory schooling, especially since they are encouraged to do so by IT's game-playing aspect. In addition, there is a need to prepare them to live and work in an increasingly computerized society whose languages and mechanisms they have to grasp and master. There is also the need to adopt an integrated approach to data-processing techniques and audio-visual media, the first of which call on logic and the second on imagination: the two systems are combined in the inter-active video-disc which makes it possible to introduce illustrated sequences into software.

Third, information technology is used more and more as a management tool. At the level of educational establishments, it is used for keeping accounts, the recording and follow-up of pupils' files and examination marks, the management of libraries and teaching materials, and so on. At the central level, it facilitates the administration of the system as a whole by processing and analysing information flows for the purpose of managing personnel, finances, buildings and equipment, and drawing up projections.

For developing countries, this application of information technology is the easiest to adopt. It requires only a small number of qualified managers, who are increasingly available. With a large number of personnel with limited qualifications, however, there are likely to be problems of storing archives

(lack of premises), mistakes in the compilation and processing of data, and slowness in adopting new procedures. In accounting terms, the assessment for adopting IT is positive (in employment terms, it is a different matter).

The other applications of information technology for education in developing countries are less obvious, except with respect to higher vocational training. The main problem is the lack of software suited to their needs, along with the more general problem that their societies are not yet computerized, except in certain sectors. The demand for an information technology acculturation has therefore not yet made itself felt. The industrialized countries should not be blithely imitated on the pretext that the information technology revolution is unavoidable. For most of the developing countries, the aim is only to train the necessary number of specialists for a given number of activities, but not yet to seek 'computer literacy'.

In both the developed and developing countries, considerable hopes have been placed in technology – i.e. audio-visual media and now computers – in order to democratize education and, at the same time, create or stimulate the interest of learners, and develop their imagination and creativity. Studies show that technology does not replace the teacher, but should be integrated into the overall teaching process in the same manner as books. Distance teaching has made education possible for young people who do not have access to school because of the far-flung nature of the population (e.g. in Australia) or for other reasons. It also serves to provide literacy training for adults (the Telescuola in Italy, the Sutatenza in Colombia, the radio schools of Honduras). Similarly, radio fora or discussion groups in India, Togo, Niger and Senegal have encouraged local education activities. Elsewhere, multi-media systems have improved teacher training. In all these cases, the use of new means has broadened the scope of education and enabled learners to attain the same standard as in conventional schools. In addition, the game-playing aspect of television and now of computers arouses greater interest and motivation in pupils, who as a result learn better. In the experience of Télé-Niger, and above all in Côte d'Ivoire, enrolment numbers have increased and efficiency has improved. In Côte d'Ivoire, from 1968–1969 to 1978–1979, the number of children enrolled in primary education rose from 322,700 pupils to 746,710, with average repetitions falling from 32.4 per cent to 20.5 per cent. Problems arise, however, when they enter secondary education, which remains traditional and highly selective: television encourages oral rather than written expression. On the other hand, new technologies have not levelled out social inequalities since, due to quantitative growth, more people have been left outside the mainstream and these belong to a massive extent to the disadvantaged sections of the population. Other experiences in Europe and North America confirm that technology does not automatically result in democratization. Nowadays, having or not having microcomputers to use is liable to accentuate social differences.

Even in a large country like India (where unit costs are lower than in small countries), television and satellite teaching programmes (SITE: Satellite Instructional Television Equipment) have not lived up to the hopes placed in them of equalizing educational opportunities while improving quality and reducing costs. According to Asok Mitra, they have not succeeded in: (a) increasing

awareness, knowledge and practice of various agricultural innovations; (b) bringing about significant changes in attitudes or practice related to birth control; (c) bringing about desirable changes in social behaviour and political participation, organizational activities or leadership; and (d) substantially increasing self-help capabilities.[3] However, SITE did increase the occupational and economic aspirations of child viewers 'even to unrealistic limits'.

In formal education, radio and television have contributed to increasing the efficiency of science teaching (physics, chemistry, biology, mathematics), especially in rural areas lacking in qualified teachers and equipment. Again according to Mitra, the drawbacks of such a system are: '(a) inflexibility of scheduling; (b) the predetermined and immutable presentation of the message, ruling out the possibility of revision or correction; (c) lack of instant interaction between the person delivering the lesson and the learner; (d) one-shot lessons and a corresponding absence of elucidation and elaboration; (e) frequent lack of graduated structuring from easy to difficult stages; (f) absence of optimum mix of the various media, chiefly instructional and methodological films, radio, television lessons, and traditional media such as the theatre and puppetry; and (g) the disaggregation of target audiences into homogeneous age groups'.[4] These difficulties are also encountered elsewhere, and some of them can be remedied, but the fact remains that it is not possible to dispense with qualified teachers, especially for the design and evaluation of programmes.

However, the media have changed the role of teachers. Traditionally, they were 'those who know about teaching children who do not know'; hence, teaching was based on authority. The learning of democracy at school requires that school become a place for developing a dialogue between teachers and learners, especially when these are young people and adults who have their own experiences and knowledge. This transformation is essential, especially since teachers are not the only people dealing with children who possess knowledge. The flow of information channelled by the media is such that even in rural areas, children can sometimes be better informed on some subjects than teachers. Teachers now have to be organizers, guides and advisers to a greater extent than transmitters of knowledge (which they still remain).

## International relations

Important global factors that influence the evolution of education include not only economic relations governing the development capacities of poor and rich countries, but also international political relations. For example, the settlement of conflicts, the decline in tension and disarmament will liberate resources for education. Cultural relations will foster the mobility of teachers, researchers and students, as well as the exchange of information and experiences; this will build cooperation between institutions for teacher and student exchanges, and for joint research.

The actors on the international scene are states, organizations, enterprises and individuals. They do not all have the same possibilities, although their activities always take place in a certain national and international context. They support each other whenever their interests coincide and clash with each other in the opposite case. The policy of a state may strengthen that of a multinational corporation

when transfers for training purposes promote exports, or may oppose that of an international organization, which is more concerned with education than with profits. Technical assistance personnel may meekly follow the directives of their governments or spread 'subversive' ideas.

In the broadest sense, a country's education is influenced by all the tangible and intangible products circulating in the world: not only ideas and knowledge, books and periodicals, cinema and television, but also capital goods incorporating a particular technology, consumer goods which arouse the desire in people to possess them and which strengthen the cultural model from which they originate, especially among those who have become familiar with them through school. The media play a major role in the propagation of the ideologies of the North: its radio stations occupy 90 per cent of the frequencies and its leading press agencies (Associated Press, Reuters, United Press International, Agence France-Presse and ITAR-TASS) disseminate 80 per cent of all messages.

For 70 years, the international scene was dominated by the competition between the communist and capitalist states, which both sought to win over the greatest possible number of supporters by whatever means. In this regard, ideological propaganda and the training of human resources played an essential role. This accounts for the importance of aid, which performs, in a subtler manner, some of the functions that used to be performed by colonization. In fact, every major power gives preference to its former colonies or its sphere of influence.

Transnational corporations do not deal only with the economy, finance and trade, but also with so-called cultural industries (books and teaching aids, information and leisure activities). Their activities involve the training of workers and managers, and more recently the production of audio-visual and electronic teaching equipment. These corporations cater to their own interests and not necessarily to those of the countries where they are established. Since the technology is generally imported without being adapted to local conditions, the training is also copied from the original model. As a result, a transnational middle class has developed, sharing the ideology of free enterprise, economic rationality and competition, success based on material criteria, and an individualistic way of life geared to consumption.

There are also influential private foundations, many of which emanate from such corporations, as their names indicate (the Ford, Carnegie, Rockefeller foundations). A large number of them finance education projects, such as the educational television series *Sesame Street* (also supported by the American Government), which was broadcast in nearly 90 countries in the 1970s (Plate 164). The programme met with opposition in certain countries: in the United Kingdom the BBC considered that it encouraged a passive attitude among children instead of stimulating their imagination and intelligence; the programme was picked up instead by the rival ITV network. In Peru it was considered incompatible with the country's educational reform (1970) based on dialogue and creative participation.

The so-called 'international' organizations are extremely diverse: they may be intergovernmental or non-governmental in nature, and pursue a variety of aims, which may or may not be disinterested, temporal or spiritual. They may be established in particular regions or cover the whole planet, and have resources of varying importance.

There are intergovernmental organizations that provide assistance for education worldwide, such as United Nations agencies (UNESCO, World Bank, FAO, WHO, UNICEF, etc.), the Council of Europe and the European Union, the OECD (Organisation for Economic Development and Co-operation representing 30 industrialized countries), and the regional development banks (the African, Arab, Asian and Inter-American Banks, etc.).

The most important institution in this field is UNESCO, which was created in 1945 with a mission to contribute to peace in the world through education, science and culture, to which communication was recently added (Plate 165). Originally the Organization had 20 Member States, but this number has now risen to 190, some 20 of which have fewer than 500,000 inhabitants. UNESCO's history has been notably marked by: the Universal Declaration of Human Rights, comprising the right to education, in 1948; the emergence of the term 'development' in 1966 and of 'UNESCO's contribution to a world economic order' in 1974; and the crisis provoked by the establishment of a 'new world information order' in 1980, which led to the withdrawal of the United States (1984) and of Great Britain and Singapore (1985) from the Organization, resulting in a cutback in its budget by one-third. (The US and Great Britain have since rejoined.) In 1988, the World Decade for Cultural Development was launched, and in 1990 a World

*Table 13* **Gross enrolment ratios by sex in sub-Saharan Africa, the Arab States and South Asia**

| Region | All | Male | Female |
|---|---|---|---|
| Sub-Saharan Africa | 76.8 | 84.1 | 69.4 |
| Arab States | 84.7 | 92.1 | 76.9 |
| Southern Asia (including India) | 95.4 | 106.8 | 83.3 |

*Source:* UNESCO, 2000, *World Education Report 2000*, pp. 115–16.

Conference on Education for All was organized with other United Nations agencies at Jomtien (Thailand). This was followed in 1992 by the creation of two International Commissions, one on Education for the Twenty-First Century and the other on Culture and Development.

The World Conference on Education for All (EFA) in Jomtien (1990) set the goal of universal primary education by the year 2000, a goal that is far from being reached. The UNESCO *World Education Report 2000* states that in 1997 (the last year for which we have global statistics), the gross enrolment ratios averaged 71.5 per cent (male: 80.6 per cent, female: 62.3 per cent) for the least developed countries and for the less developed regions. Latin American and the Caribbean, Eastern Asia/Oceania have ratios exceeding 100 per cent, respectively 113.6 and 118.0 (male and female).

Other United Nations agencies also work to develop education: UNICEF devotes itself to children of the most disadvantaged families in the fields of health, nutrition and education; the International Labour Organization deals with technical, vocational and trade union training, WHO with health training, FAO with agricultural training, etc. The United Nations University in Tokyo is not a university

in the conventional sense with lecturers and students, but the centre of a worldwide network of research and training activities for development purposes.

The World Bank should also be mentioned in this context. After having been created to assist with reconstruction after the Second World War, it became involved in education, first with respect to buildings and equipment and then reforms, with the aim of improving the efficiency of education. The accent has been shifted from secondary and higher education towards primary education, which the World Bank acknowledges as being a prerequisite for increasing the productivity of poorer sections of the population.

There are now more than 3,000 non-governmental organizations (NGOs) in the world providing assistance for education and training. They are extremely varied: in some instances, they are examples of 'cultural imperialism' and in others of selflessness and dedication. The NGOs that are warmly welcomed are those which, instead of importing their own ideas, are capable of listening to what the local population has to say, which start by asking it what its needs are and then design their assistance accordingly. Education also includes informing the poor of their rights in relations with their governments and the ruling classes, as well as of women's rights with regard to men.

Among the non-governmental organizations, religious institutions should not be forgotten. None of these is homogeneous, there are conservatives and progressives, and personalities sometimes play a more important role than structures, not to mention the influence exercised by world events. After Pope John XXIII, during Vatican II (1962–65), declared that 'development [is] the new name of peace', 'liberation theology' was briefly in vogue; the tide has now ebbed with the economic recession.

According to UNESCO's *World Education Report*, assistance to education, in current US dollars, rose from $2.02 billion in 1975 to $6.04 billion in 1990, and $6.63 billion in 1997. The $2.02 billion in 1975 are, in view of inflation, equivalent to $4.99 billion in 1990. In 15 years, assistance has therefore increased by 20.8 per cent, or slightly more than 1 per cent per year. The share of bilateral assistance fell from 70 per cent of the total amount in 1975 to 60 per cent in 1990.

The role of the World Bank became very important: it provided almost one-quarter of the assistance, while that of UNESCO was no more than 1.2 per cent in 1990 compared with 2.8 per cent in 1975. In addition to grants and loans (which do not really represent assistance if the rate exceeds 2 or 3 per cent), the assistance includes the secondment of personnel (teachers and experts) and equipment, and the award of study and training fellowships. According to the same source, the number of students abroad rose from 915,900 in 1980 to 1,177,600 in 1990 (+28.6 per cent), out of whom 757,000 (64 per cent) came from the developing countries and 334,000 (28 per cent) from the developed countries, with the remainder being undetermined. Two tendencies can be observed: a decline in the percentage of students from the developing regions apart from Eastern Asia, and an increase in the percentage of students from the developed countries, virtually all of whom pursue their studies in other developed countries, especially on account of European integration.

To what extent does international assistance benefit the developing countries? In the first place, it is influenced by strategic, commercial and financial considerations more than

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by disinterested humanism. In addition, statistical computations have shown that, for the World Bank and a country like France (but the example can be extended to other cases), there are significant correlations between the amount of assistance (or loans) and the per capita GDP of the beneficiary countries. This means that the assistance above all benefits the more privileged countries. It accordingly tends to broaden the gaps existing in the 'South'.

What is more, assistance is never free. The cost to the donors is not equivalent to the value for the beneficiary countries, except in the case of direct transfers (such as study fellowships), for several reasons. The first of these is the 'tied' nature of the assistance. Capital expenditure (such as for the construction of schools) is defrayed for the benefit of firms in the donor country, which produce the design, deliver and transport the materials, and send managers to the site; only a small proportion of the assistance benefits local labour and producers. Tied assistance obliges the beneficiary country to pay prices higher than those prevailing on the world market and to defray the transport and insurance costs incurred by the companies of the donor country.

Further, when it comes to the salaries of technical assistance personnel, which account for 70 per cent of all assistance to education, a large part is not spent locally. At least half of the salaries, perhaps even two-thirds, are kept in the country of origin or are repatriated there in the form of savings. In addition, expenditure on consumption itself is concentrated on manufactured products or even food imported from the industrial countries. Hence, only a small proportion of these earnings benefit the local economy.

In addition, the 'value' of technical assistance experts for the countries receiving them is not equal to the remuneration borne by the country sending them, but to their local replacement cost. In addition, in most instances, external assistance entails ancillary costs (accommodation, transport, etc.), which may reach or exceed the expenditure, and which the country would have to defray if it employed its own nationals.

The fact that international assistance finances capital expenditure in foreign exchange tends to favour foreign rather than national enterprises. This results not only in higher costs but also in sumptuous and unsuitable architectural designs because they have been produced in the developed countries. These prestige buildings make a deplorable impression alongside the nearby shanty areas which can be seen in so many cities of the developing countries. The squandering of resources is all the more regrettable in that the buildings are not fully used. UNDP (the United Nations Development Programme) has found that they have a utilization rate of only 20 per cent, and for equipment this rate is only 12 to 15 per cent. Many buildings are closed for four months a year and at 6 in the evening.

Other dangers stem from a naive enthusiasm for innovations, regardless of what they are, without account being taken of the national context. Before projects proposed by bilateral or multilateral assistance are implemented, even on an experimental basis, they should first be studied thoroughly. Pilot experiments often enjoy advantages and possibilities (in terms of funds, personnel and equipment) which the country cannot afford once the external assistance has been withdrawn. Advanced technology (audio-visual programmes, computers, satellites, etc.) demands enormous expenditure on the part of poor countries lacking energy sources and involves risks of financial, technological or

ideological dependence on those supplying both the hardware and software.

The foregoing analysis has shown some of the reasons why the economic return of assistance for education is so low. In the 1960s, the Pearson Commission already considered that for every $100 devoted to technical assistance, there was a probable transfer to the beneficiary country of foreign exchange equivalent to only $20.

For many countries, far from representing a loss, the reduction or halting of international assistance would perhaps be a chance, an opportunity for rethinking their problems, for seeking solutions suited to their national context instead of expecting to receive ready-made solutions from outside. Real solutions are never merely technical; the problems of the young states are above all of a political and cultural nature. Indeed, 'foreign assistance never represents more than an additional contribution or a starting-point. Only the efforts of the population can establish and entrench the basis of growth and can guarantee that it will last'.[5]

## EDUCATION AND DEVELOPMENT

In the first part of this chapter, we considered the global factors that influence education in accordance with trends varying from country to country, and depending on political system, social relations and power structure, and the state of human, financial, scientific and technical resources.

A recurrent theme of the second half of the twentieth century has been the question: To what extent do education policies influence development? The conventional dichotomy between developed and developing countries is largely artificial, since all countries are intent on development, although through different means and resources. In addition, the concept itself is open to many interpretations.

For a long time, the concept of development was reduced to that of 'economic growth' and it was only gradually that the term 'economic and social growth' came to be used. The 'cultural dimension' was introduced more recently, following the failure of most of the countries of the South to emulate the 'capitalist' and 'socialist' models. The latter model, in fact, is bankrupt, while the former is proving incapable of resolving its own problems, such as unemployment, inequalities, violence, the destruction of the environment.

Moreover, the 'development of education' involves not only public or private schooling but also 'non-formal' education organized for specific groups with a view to achieving certain objectives (literacy, for example) and of 'informal' education, which includes learning through work, the mass media, travel, etc.

Because of these many and varied aspects, education, like development, is a contradictory phenomenon, in the sense that it has both positive and negative aspects. But for whom are these aspects positive or negative? It is obvious that the same effects can be positive for some groups and negative for others, that what is negative at one point in time can become positive at another. However, there is also a contradiction between the different dimensions of education. Just like economic growth, it can exacerbate inequalities between cities and the countryside, between regions, between social classes, and between ethnic groups. Economic growth requires the training of qualified specialists, hence the need for selection at the entry to higher education. However, the best applicants do not very often come from

the disadvantaged classes, but from those which are culturally and economically favoured. This was the dilemma of the socialist countries, which finally resolved it by giving priority to the economic sector over social egalitarianism.

There is also opposition between the economic and cultural spheres. Teaching in a widely spoken foreign language gives direct access to international scientific and technological literature. It is therefore a factor in development. However, it will make young people more remote from their cultural roots and will contribute to the brain drain. The consequence is most serious when foreign universities perform such educational activities established in the country, such as the American and French universities in Beirut.

Within formal education itself, there is a major contradiction, in that it is expected to contribute simultaneously to reproducing set social patterns and bringing about change: scientific and technical change in order to increase physical resources; social change because ruling classes everywhere need to renew themselves and integrate the best elements of the other classes, if only to ensure their own legitimacy. Hence selection-conservation based on belonging to a social class has to be supplemented by selection-mobility based on abilities. Do schools perform this second function badly or well? It is the former, if many gifted children from underprivileged classes abandon their studies owing to a lack of resources; it is the latter, if the filtering process allows a small number to advance, but not too many. In other words, school wastage is costly in pedagogical and financial terms, while schools are 'functional' for the privileged classes because they work to their advantage. Moreover, the use of a foreign language is an important factor in selection (as in Africa).

Before examining the relationship between education and 'development' in more detail, a statistical overview is necessary.

## Statistical overview

Whereas the growth in pupil numbers in the first half of the twentieth century was slow because of wars, economic depression and reigning conservatism, the second half saw those numbers grow quickly at all levels until the 1970s,

*Figure 4* **Net enrolment ratios for the 6–23 age group, by region (1970–1990)**



* Refers to developed countries in Asia and Oceania.
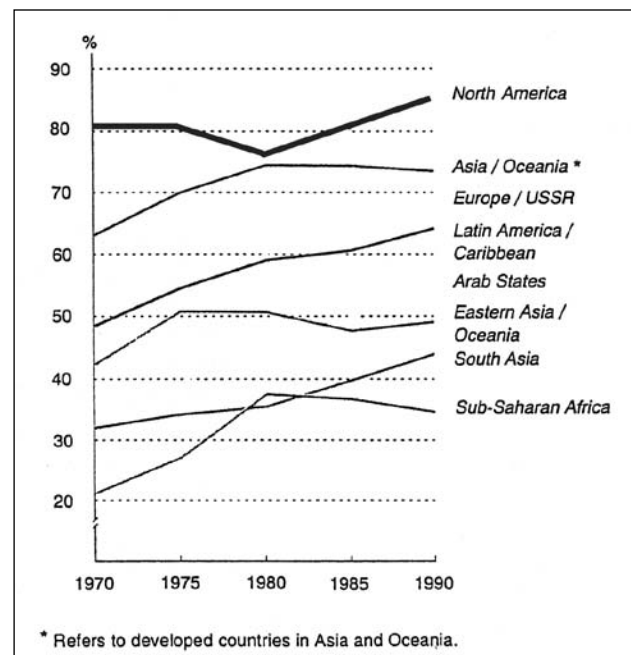
*Source:* Adapted from UNESCO, 2000, *World Education Report 2000*, pp. 46, 62.

when the oil crisis and its consequences appeared. Enrolment continued to rise, but at a lower rate. Similarly, after having increased until the 1980s, illiteracy fell in both numbers and percentages. However, inequalities continue to exist both between countries and within individual countries, between sexes, urban and rural areas, regions, social classes, and ethno-linguistic groups.

Enrolments worldwide rose from 328 million in 1960 to 618 million in 1970, 843 million in 1980 and 975 million in 1990 (excluding pre-primary enrolments). However, the rate of growth gradually slowed down from 88 per cent in 1960–70 to 36 per cent in 1970–80 and to 16 per cent in 1980–90. This rate was naturally not the same in all countries and in all regions or for all levels of education. Figure 4

*Table 14* **Enrolments and gross enrolment ratios, 1990–1997**

| | 1st Level | | 2nd Level | | 3rd Level | |
|---|---|---|---|---|---|---|
| | Millions | Rate | Millions | Rate | Millions | Rate |
| **More developed regions** | | | | | | |
| 1990 | 61.3 | 99.2 | 68.9 | 94.5 | 29.1 | 34.2 |
| 1997 | 62.9 | 103.5 | 75.8 | 108.0 | 34.2 | 61.1 |
| **Countries in transition** | | | | | | |
| 1990 | 29.7 | 97.5 | 38.2 | 91.5 | 10.7 | 36.1 |
| 1997 | 27.4 | 96.7 | 41.1 | 87.0 | 11.0 | 34.0 |
| **Less developed regions** | | | | | | |
| 1990 | 505.9 | 98.9 | 207.9 | 42.1 | 28.8 | 7.1 |
| 1997 | 578.2 | 101.7 | 281.3 | 51.6 | 43.0 | 10.3 |
| **Less developed countries** | | | | | | |
| 1990 | 53.8 | 65.8 | 12.1 | 17.2 | 1.2 | 2.5 |
| 1997 | 68.7 | 71.5 | 16.9 | 19.3 | 1.9 | 3.2 |

*Source:* UNESCO, 2000, *World Education Report 2000*, pp. 115–16

shows trends in net enrolment ratios for the 6–23 age group, by region, for the period 1970–90. The gross ratio is the ratio of the number of pupils at each level, regardless of their age, to the population of the corresponding age group. This is why it may exceed 100 per cent because of repeaters having exceeded the official age. The number of enrolments and the gross ratios by level are given in Table 14.

In the developed countries, enrolments in primary education have fallen since 1970, owing to the decline in population. The developed countries, accounting for 20 per cent of the world's population, represent 18 per cent of enrolments at the 1st level, 30 per cent at the 2nd level, and 55 per cent at the 3rd level. In developed countries, for every 1,000 pupils at the 1st level, there were 802 at the 2nd level and 315 at the 3rd level. The corresponding figures for developing countries are 420 and 57.

The figures in developing countries show the scale of school wastage experienced by many countries, especially in Africa, where the vehicle of teaching is a foreign language. The English-speaking countries, which use local languages to a greater extent in primary education, are less affected than the French-speaking and Portuguese-speaking countries. In addition, it is estimated that there are millions of children who are not enrolled at all, chiefly among girls and young people in rural areas.

A positive factor is the increase in the enrolment of girls, which exceeds that of boys at the secondary and higher levels in the developed countries and is catching up in the developing countries (it is already higher at the secondary level in Latin America and the Caribbean).

The increase in enrolments accounts for the fall in illiteracy. In overall terms, after the number of illiterates aged 15 years and upwards had increased from 700 million in 1950 to 742 million in 1970 and 946 million in 1980, this figure fell to 882 million in 1997, and will decline to around 857 million in 2005. Because of the size of its population (more than half the world figure), East and South Asia have the highest number of illiterates, amounting to 430 million in 1997. Conversely, the developed countries still had 14.2 million illiterates in 1997, of which 9.8 million were women.

The illiteracy rate, which stood at 44 per cent of the adult population in 1950, fell to 32.8 per cent in 1980 and 22 per cent in 1997, In addition to the greater enrolment numbers of young people, this reduction is also due to the decline in population growth. The highest population growth rates are to be found in South Asia (54 per cent), sub-Saharan Africa (53 per cent) and the Arab States (49 per cent). The rate in the developed countries is 3.3 per cent.

Illiteracy always affects women more than men (28 per cent as against 16 per cent in 1997) and rural dwellers more than urban dwellers (on average three times more). Even the industrial countries have discovered, or rediscovered, illiteracy in their midst, not only among immigrant workers, but also in some social categories where people read and write little and gradually become illiterate.

The gap between North and South is again obvious at the financial level. Overall, in current dollars, public

*Table 16* **Percentage of the 1985–1986 cohort reaching the grade**

|  | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Developing countries** | 100 | 82 | 76 | 71 |
| **Africa** | 100 | 85 | 82 | 77 |
| Arab States | 100 | 95 | 92 | 88 |
| French-speaking countries | 100 | 68 | 68 | 59 |
| English-speaking countries | 100 | 92 | 89 | 84 |
| Portuguese-speaking countries | 100 | 71 | 54 | 42 |
| **Latin America and the Caribbean** | 100 | 73 | 66 | 60 |
| **Asia and Oceania** | 100 | 96 | 94 | 91 |
| Arab States | 100 | 98 | 97 | 95 |
| Other countries | 100 | 96 | 94 | 91 |
| Oceania | 100 | 96 | 94 | 94 |
| **Europe** | 100 | 99 | 98 | 98 |

*Source:* UNESCO, 1988, ED/BIE/CONFINTED 41/Ref.1, Paris, October, p. 35

*Table 15* **Gross enrolment ratios by level and sex in 1997**

|  | 1st level | | 2nd level | | 3rd level | |
|---|---|---|---|---|---|---|
|  | M | F | M | F | M | F |
| **Less developed countries** | 107.6 | 95.5 | 107.0 | 109.2 | 12.0 | 8.5 |
| Sub-Saharan Africa | 84.1 | 69.4 | 29.1 | 23.3 | 12.0 | 2.8 |
| Arab States | 92.1 | 76.9 | 61.2 | 52.3 | 17.3 | 12.4 |
| Latin America and the Caribbean | 116.9 | 110.2 | 59.2 | 65.3 | 20.1 | 18.7 |
| Eastern Asia and Oceania | 118.3 | 117.6 | 69.3 | 63.1 | 12.5 | 9.0 |
| of which China | 122.5 | 123.0 | 73.7 | 66.2 | 7.8 | 4.2 |
| Southern Asia | 106.8 | 83.3 | 54.1 | 35.8 | 9.1 | 5.1 |
| of which India | 108.8 | 89.5 | 59.1 | 38.2 | 8.8 | 5.5 |
| **More developed countries** | 103.6 | 103.4 | 107.0 | 109.2 | 56.8 | 65.8 |

*Source:* UNESCO, 2000, *World Education Report 2000*, pp. 115–16

expenditure on education has increased more in the North than in the South: in the less developed countries it rose from US$48.5 billion in 1980 to US$242.4 billion in 1997, an increase of more than 2.5 times; in the developed countries it rose from US$476.1 billion to US$951.1 billion, an increase of approximately 200 per cent. The percentage in relation to GNP varies little between 1980 and 1997: about 5.1 per cent more in the developed regions, and rising from 3.8 per cent to 3.9 per cent in the less developed regions.

While these rates are quite similar, the size of the gap between the absolute figures should not be overlooked, with 84 per cent of the world total for public expenditure on education being dedicated to 26 per cent of the enrolment numbers (the North) and 16 per cent of the total for the other 74 per cent (the South). These figures are evidence of the quantitative and qualitative disparities in level, since cost is largely bound up with quality. In 1997, the developed countries spent an average of US$5,360 per pupil of all levels, while the less developed countries spent US$194. Within the developing countries, there are considerable variations according to the regions: in 1990, the average expenditure ranged from US$252 per pupil in sub-Saharan Africa to US$465 in Latin America and the Caribbean; US$182 in Eastern Asia/Oceania, US$164 in Southern Asia and US$584 in the Arab States. Expenditure also varies considerably according to the level. Higher education is particularly expensive in Africa with regard to its per capita GNP: US$1,611 per student as against US$305 in Southern Asia, US$817 in Eastern Asia/Oceania, US$1,726 in the Arab States, and US$1,169 in Latin America and the Caribbean. The same differentials are found with respect to scientific and technological potential.

Europe's share of the expenditure fell significantly on account of the economic difficulties following the collapse of communism in Eastern Europe. On the other hand, the share of Asia/Oceania made massive strides bound up with the increase in its human potential. This region comprises countries that are already developed (Japan, Australia and New Zealand) or are being rapidly industrialized (e.g. Taiwan, Hong Kong, Singapore, and more recently China, Thailand, Republic of Korea, Malaysia, Indonesia and India). High-technology centres are being established, such as that at Mangalore, the 'Silicon Valley' of India.

### Education and economic development

Economic development is usually defined by the sustainable increase of the overall GNP, or better still, by the per capita GNP, which has been most studied. It can be broadly said that until the late 1960s, the tendency was to emphasize the contribution made by education to economic growth; since then, factors such as its unsuitability and the reproduction of inequalities or dependence have above all been highlighted. Analysis has gone further and deeper. Setting out from an 'external' point of view whereby education is considered as being an economic activity and a statistical aggregate related to the GNP, an attempt has been made to learn more of the internal workings of education and the way in which its structures, contents and methods act on the economy and are influenced by it. In particular, interest has focused on the relationship between training and employment, between learning and working.

In general and theoretical terms, education can be said to be a factor of growth inasmuch as it contributes to:

– The propagation of knowledge and of attitudes conducive to production – economic rationality, technical skills, entrepreneurship, etc. Naturally, this is not sufficient: knowledge has to be applied to production and attitudes reflected in behaviour patterns.
– The raising of the qualifications of the labour force and hence productivity. In the industrial countries, this is often measured in terms of occupational earnings. However, there is no linear correlation between education, qualifications and earnings. This link is biased by an even larger number of factors in the developing countries, especially in Africa, where it is not uncommon for appointments to be made on an ethnic basis. It would be possible, however, to apply cost-benefit analysis to production itself (by evaluating the training costs and examining how training results in an increase in production).
– The training of the different categories of managers (administrative, technical, economic and social) and workers (agricultural, industrial, semi-skilled and skilled).
– The education of consumers, so that they make rational choices between the different sources of supply, with a view to ensuring that the economy allocates resources efficiently.

**Table 17** **Research and development in terms of personnel and expenditure** *(percentage per region)*

| Region | 1980 | | 1990 | |
| --- | --- | --- | --- | --- |
| | Personnel | Expenditure | Personnel | Expenditure |
| North America | 17.6 | 32.1 | 17.8 | 42.8 |
| Europe | 57.8 | 49.4 | 53.3 | 35.5 |
| Asia/Oceania | 20.3 | 14.5 | 23.6 | 20.2 |
| Sub-Saharan Africa | 0.8 | 0.4 | 0.7 | 0.2 |
| Arab States | 1.3 | 1.8 | 1.5 | 0.7 |
| Latin America and the Caribbean | 2.2 | 1.8 | 3.1 | 0.6 |
| | 100 | 100 | 100 | 100 |
| Total % | | | | |
| Total in US$ | $3.9 million | $20.8 billion | $5.2 million | $453 billion |

*Source:* UNESCO, 1993, *World Education Report 1993*

– The provision of training in research and innovation with a view to better resolving the problems of development.

However, education can prove to be a brake on growth because of the following factors:

– the transmission of attitudes inimical to production (contempt for manual work, agriculture, etc.);
– the dissemination of bookish knowledge having no bearing on real life and incapable of being used for development purposes, which can therefore result in the training of the 'graduate unemployed';
– the possible lack of skilled personnel if too many students pursue their studies and if the education system employs too many people who could be used in the productive sector;
– the undue cost of education, which reduces the scope for investment; and
– international assistance, which transmits unsuitable cultural models, imposes high recurrent charges and contributes to the brain drain.

These factors can be seen above all in Africa, chiefly for historical reasons and because of its lack of human and financial resources.

The unsuitability of education for production, which, among other things, results in unemployment, cannot obviously be attributed to the education system alone. The economy, too, is responsible if its rate of growth is very much lower than the enrolment ratio (in which case the economy has a low absorption capacity).

For a long time, the developing countries – and the states and international organizations assisting them – have given priority to secondary and higher education producing qualified managers who increase productivity and make it possible to employ the labour force. The statistical surveys carried out in the developed countries demonstrated this and the theory of human capital was propagated everywhere. The priority given to this was itself linked to a strategy, which laid stress on the modern sector and on industrialization with imported techniques, providing employment for only a limited number of top and middle managers.

Agriculture, which occupies from 60 to 80 per cent of the world's population, was neglected and its stagnation or low growth eventually had an impact on the economy as a whole. As a result, a considerable proportion of the budget, amounting in some cases to as much as 60 per cent, was allocated to secondary and higher education, whereas the numbers in that category did not exceed 20 per cent of the total. Over the period from 1950 to 1970, enrolments tripled at the first level, increased more than five times at the second level and six times at the third level (the high ratios are partly explained by the low starting points). From 1970 to 1990, enrolments increased by 60.3 per cent at the first level, 2.6 times at the second level and 3.9 times at the third level. The priority for secondary and higher education still exists, but the post-primary numbers now form one-third of the total.

It was this 'economics-based' idea that gave rise to the idea of 'functional literacy'. Launched by UNESCO, it was adopted by the World Congress on the Elimination of Illiteracy held in Tehran in 1965 and implemented the following year in the form of an 'Experimental World Literacy Programme' (EWLP), which was carried out with the assistance of UNDP, FAO, ILO and WHO in some

20 countries until 1973. The idea was to make literacy a component of development projects (in reality, this was generally reduced to its economic dimension). The corollaries of 'functionality' were as follows: selectivity of the activities which covered areas of industrialization and agricultural modernization and involved the individuals who were most likely to profit by them and who were therefore the most motivated; intensity of the learning of knowledge and attitudes contributing to development; adaptation to the needs of each category of workers, as a result of which programmes were diversified; integration of education into practical life, the vocational activities of workers and the problems they encountered in facing a proposed change.

In order to draw up a functional literacy programme, a prior study was made of the (agricultural or industrial) environment and of the individuals involved; the next step was making a list of the knowledge needed and laying down the timetable of activities. Theoretically, illiterates were trained to take charge of each of the problems put to them and to study them with the aim of resolving them. In fact, in most cases, the solution was provided to the trainees from the outside and the role of the community organizer consisted solely of prompting them to recognize the merits of the solution and apply it (bedding out rice, harvesting cotton, irrigation, combating diseases and insects, self-management, marketing, etc.).

It was in the course of studying the problem that the workers were taught to read, write and calculate, and that efforts were made to develop their reasoning and understanding capacities. Theoretical training (vocational, technical and scientific, socio-economic, oral and written expression) was accompanied by practical training at the places of work. From the outset, synchronized learning of reading and writing was aimed at developing the ability to perceive simultaneously the symbols and their meaning according to the progressive pattern:

Sentence → word(s) → syllables → letters → syllables word(s) → sentence.

What were the results of the EWLP? In 1974–1975, UNDP (the main funding source) and UNESCO (the main executing agency) carried out an evaluation. This proved to be complex, as was the undertaking itself on account of its novelty and the little experience which national executing agents and foreign advisers had of the subject. Accordingly, the data collected were often of a summary nature and difficult to compare: the tests and criteria varied significantly in degree and subject (reading, writing, calculation, vocational training), from one project to another, and even in a single country from one region to another. In addition, the starting level was different. Roughly one million illiterates were involved, but a varying proportion sat the examinations and an even smaller proportion passed them: 8 per cent in Sudan, 14 per cent in Iran, 21 per cent in United Republic of Tanzania, 23 per cent in Ecuador, and 25 per cent in Ethiopia. The level achieved by the new literates is comparable to that of primary school pupils in the country. Changes were considered favourable in the majority of cases: people showed interest in continuing to learn, seeking information to satisfy their needs, using knowledge to manage their affairs and increase their productivity, wishing to raise living standards rather than

having a large number of children. The cost of the programme was considerable, amounting to more than US$32 million over six years, of which the countries paid two-thirds. Expenditure on individual projects varied between US$600,000 and US$6 million, so that the cost per person enrolled and, above all, the cost per participant having passed the final examination also varied. The latter amounted to US$212 in Ethiopia, US$269 in Sudan, US$300 in Ecuador, US$332 in Iran, as against US$32 in Tanzania. Except for Sudan, this cost was lower than that of primary school enrolment for an equivalent level. It obviously should not be concluded that adult literacy training could replace child education, which performs other functions.

The World Bank for its part compiled data on the relationship between instruction and agricultural productivity, and made the following conclusion in its *World Development Report 1980*[6]: provided that additional inputs required by the adoption of improved cropping techniques were made available, farmers who had attended primary school for four years had an annual output higher on average by 13.2 per cent than that of farmers who did not attend school. The additional output of farmers having attended school but not having access to additional inputs was generally lower, although still considerable. When the increase in production resulting from attendance at school is compared with the cost of schooling, the rates of return bear very favourable comparison with those of investments allocated to other sectors.

In industry, the productivity resulting from both capital and the labour of managers and workers is more difficult to evaluate. It is measured indirectly by wages. However, wages, especially in the developing countries, are not directly linked to the level of instruction but to qualification (arising from age and experience) and to social and political factors (especially in the case of the civil service). While there is no denying that, on average, wages rise with the level of instruction, that level represents a necessary but not sufficient condition for industrial development. Many countries have high economic growth rates in spite of a low level of literacy, whereas the converse is true for others. In Asia, for example, Pakistan, with a literacy rate of 20 per cent, developed its industry by 10 per cent a year over the period from 1960 to 1970, while the economy of Burma, a country with a 65 per cent literacy rate, grew by only 2.8 per cent. Industry requires not only scientific and technological skills but also a spirit of initiative and management capacities, which are not learnt from books but from management itself.

One should not have too narrow a view of relations between education and economic growth. At first sight, elementary education does not concern industrial development as much as secondary and higher education. In reality, it is instrumental in acquiring learning, which will later make vocational and in-service training possible, along with attitudes conducive to work (discipline, emulation).

Similarly, women's education displays a large number of advantages with regard to children's health and nutrition as well as their instruction. It also has an influence on fertility by deferring the age at which women marry and by informing them about reproductive health and similar issues.

Education should not be confined to school but should use all possible forms, in particular in-service training at the place of employment. Apprenticeship is the main form of acquiring qualifications in crafts. In industry, several lines of

research suggest that on-the-job training has perhaps played a more important role than formal education in the rapid strides made by some countries (Japan, South Korea). In the case of some technical occupations, simple literacy training is sufficient to give people the same level of opportunities as elementary schooling.

Another approach tried out by developing countries in order to raise the productivity of education is the association of study and productive work. It derives from the polytechnic ideal formulated by Karl Marx, who considered it not only as a method of social production but as the one and only method of producing complete human beings (*Das Kapital*, Book 1). All countries that drew their inspiration from his thinking endeavoured to put this into practice, first in the Soviet Union and Central Europe, then in the developing countries. Cuba, China and Viet Nam all established schools for part-time work and part-time study, schools associated with production units, not to mention the time devoted in all classes to socially useful work (such as the maintenance of schools or, from a certain age onwards, productive work). To take one example, in Viet Nam the School of Young Socialist Workers of Hoa-Binh was founded in 1958 by the avant-garde youth of this region. As a half-work and half-study school giving a complete education from the first level to higher education, it trained senior officials for the administration, technical services (agronomists, engineers) and cooperatives. On an area of 400 hectares, the pupils cultivated manioc, maize, sweet potatoes and rice. In addition, they reared cattle, pigs, buffaloes and poultry and manufactured manioc flour, liqueurs and alcohol, vermicelli and sauces. There were also mechanical, carpentry and blacksmith's workshops. The school was not only self-sufficient as a result of its earnings, but even brought in revenue for the state, which did not prevent its pupils from equalling those of ordinary schools at examinations. In spite of the value of the experiment, it could not be widely implemented owing to a large number of difficulties: the lack of motivation on the part of teachers, pupils and parents; the negligence of the authorities; the prestige of traditional education; and the financial cost. Attempts to form associations with enterprises came up against resistance because they felt that this would disrupt their operations.

In other countries, the introduction of productive activities in schools often ended in failure for one of the following reasons: over-ambitious objectives, unsuitable or insufficient resources, unprepared teachers, pupils and families, and the lack of linkage with other educational reforms, in particular with the examination system. For instance, if examinations remain traditional and continue to attach great value to book knowledge without taking account of productive work, how can such work motivate pupils and teachers?

The biggest problem – which has already been mentioned and with which all countries, developed and developing alike, have to contend – is unemployment, that is, from the educational point of view, the relationship between training and employment. It is true that unemployment is first of all an economic problem. If the economy does not develop, if it uses production techniques that cut back on labour, it cannot provide sufficient jobs for the young people who leave school each year and come onto the labour market. However, although schools are not primarily responsible for unemployment, they can contribute to it by instilling

*Table 18* **Expenditure on higher education**

| Region | Expenditure per student (% of GNP per capita) |
|---|---|
| Sub-Sarahan Africa | 68.3 |
| Arab States | 65.5 |
| Latin America and the Caribbean | 34.7 |
| Eastern Asia/Oceania | 63.9 |
| Southern Asia | 72.8 |
| Less developed regions | 68.0 |
| Least developed countries | 88.2 |
| More developed regions | 52.7 |
| Countries in transition | 40.7 |

*Source*: UNESCO, 2000, *World Education Report 2000*, p. 119

contempt for manual work, by transmitting bookish knowledge having no bearing on life, costing too much and thus absorbing resources that could be directed to more productive sectors. Apart from exceptional cases, these defects are more conspicuous in the South than in the North, because most developing countries have adopted the education systems of the industrialized countries without sufficient adaptation to their own needs.

The new industrial countries of East Asia appear to have adapted their education systems better. This is not a question of quantity. In 1996, for example, China had only 473 students per 100,000 inhabitants, as against 1,767 in Mongolia, 1,895 in Egypt, or 3,117 in Argentina. What is much more important is the level of instruction and qualification of the labour force and managers, their dexterity, their discipline, and the dynamism of the policy of the state and enterprises. Some authors account for the success of the countries of East Asia by one feature they have in common: the heritage of Confucianism which stresses the importance of education and work, a 'community' rather than 'individualist' social style and a 'functionalist' rather than 'political' conception of the state.[7]

In a bid to react to unemployment and the recession, attempts have been made almost everywhere to ensure closer liaison between school and university and the world of work, in some instances by alternating between the two, in others through exchanges of teachers and researchers, or future employment contracts. In terms of streams and contents, the developed countries and some of the developing countries, especially the new industrial countries of Asia and Latin America, are introducing technical and vocational subjects into general instruction and promoting vocational and technical secondary and higher education. In these countries it appears that this form of education 'produces' many fewer unemployed than general education. Also, continuing education is being developed to provide for refresher and further training for the labour force and managers.

What is happening, in fact, is that the scientific and technical revolution is changing, albeit to an unequal degree from one branch to another, the organization of work, the structure of qualifications, and productivity. This is again highlighting the importance of human resources, which had been somewhat blurred by disappointment over the

economic results produced by the enormous expenditure on education during the 1950s and 1960s. Although it is no long believed that there is an automatic causal effect between education and economic growth, international comparisons show that the most competitive countries are those which have best managed to adapt their education and training system to new global developments, in particular dissemination of recent information technologies. On the one hand, these countries are more efficient in replacing a low-skilled labour force in various production and office tasks; on the other, they require a high level of skills for design, direction, and management and control tasks. More than financial expenditure and equipment, it is human capital that determines productivity, not only in terms of instruction but also of initiative, creativity and autonomy.

All governments are concerned with improving the teaching of mathematics and sciences, which are at the base of present-day scientific and technical culture. The research carried out by IEA (International Association for the Evaluation of Educational Performance) shows that the level in these subjects has risen everywhere (except in the United States) among 14-year old pupils in the sciences. Moreover, the enrolment of girls has increased significantly in these disciplines (in Hungary, it even exceeds that of boys, with 63 per cent of the final class in mathematics in 1982 being girls); although their performances are generally lower than those of boys, the differences have declined. The progress made by developing countries in science and mathematics education can also be noted. Thailand, which participated in the two studies on science teaching (1970–71 and 1983–84), has seen its 14-year old pupils equal the score of those in the United States (at 16.5), whereas it had lagged far behind in 1970. The other developing countries obtained the following results: South Korea, 18.1; Hong Kong, 16.4; the Philippines, 11.5. For pupils in the final class in secondary school, Hong Kong came in first, followed by England and Singapore, in chemistry; and by England, Hungary, Japan and Singapore in physics; Singapore came in first in biology, followed by England. There can be no doubt that this progress is partly a factor and effect of economic progress.

### Education and social development

Social development can be defined by the raising of the general standard of living, the satisfaction of the growing material needs of the population, the reduction in inequalities, and the advancement of disadvantaged groups. As already stated earlier, the universal expansion of schooling has not led to the disappearance – even among the most 'developed' countries – of the inequalities between sexes, between urban and rural areas, between geographical regions, between social classes, and between the majority and national or immigrant minorities.

The main causes of this are differences in economic level, political discrimination and the social groups to which people belong. This last-mentioned factor is the most difficult to change since social structures are altered only in the long run.

Academic success, which is taken to mean the level of acquisition in a course of education given over the prescribed period, implies not only access but also survival and final performances. However, neither access nor survival, not to

mention performance, is guaranteed in the poor countries. In the others, survival may be accompanied by repeating and failure to keep up with age groups, in the same way as significant differences in results are observed from primary school onwards. Children from less-privileged classes succeed less well than the others, and this disparity becomes more marked in the course of schooling. In terms of equal success, the chances of carrying on with post-compulsory studies are not the same, since young people from modest family backgrounds have to go to work sooner in order to earn a living. At the higher educational level, data from OECD countries between 1960 and 1970 show that the proportion of working-class children is always lower than the proportion of their fathers in the active population, while the rate of representation of the 'upper-class' children in higher education ranges from 1.5 in the United States to 11 in Spain and Portugal. The latter have twice as many chances of having access to higher education than the former in the United States and the United Kingdom, three times more in Greece, and 18 times more in France.[8] Yet these figures should not obscure the movement of democratization that did occur in higher education: the proportion of workers' children in higher education in the Federal Republic of Germany tripled over the period 1952–76, rising from 4 per cent to 13 per cent; in Sweden, in 1969, they had a 10 per cent chance of acceding to higher education compared with hardly 2 per cent 25 years earlier.[9] However, students from the two different social backgrounds do not turn towards the same disciplines: young people from affluent families tend to choose disciplines that they expect will keep them in their original environment, with high status and earnings (such as medicine, law, and political science). The others are content with less 'prestigious' studies, those that will enable them to work at the same time. This tendency contributes to slowing down the reduction in social inequalities.

The ex-socialist countries had significantly democratized education and at a more rapid pace. However, the disparities have not disappeared. Fewer children of manual workers and peasants enter higher education, especially full-time education, than those of white-collar workers. In the Soviet Union, they formed 34.3 per cent and 23 per cent respectively, as against 70.4 per cent of the secondary school leavers; 45.5 percent and 7.5 per cent against 47 per cent of the higher education students.[10] On average, the children of white-collar workers had 2.8 times more chances of entering full-time higher education[11] than those of manual workers, and 4.3 more chances than those of collective farm workers. In Poland, in 1984, 56 per cent of higher education graduates came from white-collar families, 32 per cent from blue-collar families, and 11 per cent from peasant families; the percentages are reversed for evening classes, at 36 per cent, 56 per cent and 6 per cent respectively.[12]

The South is a very mixed group of countries and the data are inadequate for making generalizations. It seems, however, that the correlation between social background, or rather between the level of instruction of the father, and the success of the child at school, is less tight in developing than in industrialized countries.

For instance, more than half the fathers of higher education students in Buenos Aires (1958) and Cordoba (1961) had not studied or had only completed their primary studies. By contrast, the great majority of them belonged to the middle classes (self-employed, middle-grade managers,

officers and non-commissioned officers: 45 per cent [Buenos Aires] and 43 per cent [Cordoba] respectively) and upper classes (industrialists, businessmen, top managers and professionals: 39 per cent and 44 per cent, respectively). The other students were from a working-class background (9.2 per cent in Buenos Aires and 4.5 per cent in Cordoba) or were not determined.[13] The composition of universities is less elitist in Africa, where social stratification is less marked (but universities are more elitist in that they admit a lower proportion of the age group). In Rwanda, for instance, the children of farmers form 65 per cent of all higher education students. It is true that they are under-represented, since their fathers represent 93 per cent of the active population, but they do make up a considerable portion of higher education enrolments, which is not the case of Latin America. The remainder in Rwanda is distributed as follows: professions and top managers, 6 per cent; middle-managers and teachers, 17 per cent; white-collar workers, 4 per cent; craftsmen and manual workers, 4 per cent; and traders, 4 per cent. However, higher education students represent only 0.3 per cent of the 20 to 24-year age group (compared with 30 per cent in Argentina), and girls represented 11.8 per cent of the enrolments and 9.8 per cent of the graduates in 1981–1982. The level of instruction of the parents is not known, but the vast majority of the peasants and manual workers are illiterate or semi-illiterate.[14]

What are the factors of success at school? They can be divided into three groups according to whether they relate to the family, school or conditions in the country. These factors are linked together, since success is all the more certain when the culture of the family is closer to that of the school and when its earnings enable young people to continue their studies, but they do not act mechanically: failure is not something that is bound to happen. Their importance varies from society to society: it has been noted that, in many developing countries, rich and poor alike share the same attitudes towards school, which is considered as being the essential, indeed the only, means of social advancement, and they encourage their children in that direction. The respective shares of objective and subjective factors in fostering success are not precisely known. According to the studies conducted by the IEA,[15] it appears that the influence of the social environment tends to decline as the level of education rises, which is explained by the over-selection of children from the lower classes and the progressive cultural levelling-out. On the other hand, the relative influence of the home and school varies with the disciplines. For instance, the level attained by 14-year old pupils in French and English (taught as foreign languages) is more closely bound up with the differences between schools (in other words the quality of the teaching), which is not the case for the sciences, the understanding of texts in the mother tongue, literature and civil instruction.[16]

Ethnic inequalities exist in all countries, but to varying degrees. In the developed countries, these consist of inequalities between the 'majority' and either national or immigrant minorities. In the first case, the best-known example is that of African-Americans in the United States. The Coleman Report *Equality of Educational Opportunity*[17] noted that the grade average of five tests (non-verbal, verbal, reading, mathematics, general knowledge) at the end of secondary schooling (grade 12) was 41.1 for African-Americans as against 52 for Whites. At the same period,

19 per cent of the Whites and 5 per cent of the African-Americans in the 25–29 year age group had obtained a university degree. Since this date, the enrolment of Blacks has made considerable progress and inequality has declined, although it has not disappeared altogether.

Similarly, it was noted in the former Soviet Union that there were differences in the level of instruction of the population according to the republics. In 1989, there were on average 812 people with a higher or secondary level education for 1,000 inhabitants aged 15 and upwards. The figures varied between 753 in Lithuania and 901 in Armenia, with Russia being close to the average with 806 persons. Here, too, progress has been made, especially when drawing comparisons with the beginning of the Soviet Revolution, when national minorities were virtually illiterate.

The most systematic segregation was to be found in South Africa, where the apartheid regime had set up four separate school systems: for Whites, Asians, Coloureds and Africans. The last group was heavily enrolled in primary education, since industry needs an educated labour force, but found themselves being virtually deprived of access to higher education, in other words to high positions, which were reserved for Whites. In India, the caste system has been abolished officially under the Constitution, but it continues to exist in people's minds and in reality: the 'scheduled' or untouchable castes and tribes represent 150 million people, more than one-fifth of the total population, who are disadvantaged from every point of view.

This, generally speaking, is also true of minorities in Africa who live in the interior or mountainous regions. Even in instances where the central government has taken measures in their favour, the reduction in inequalities is taking place very slowly. These inequalities are, in fact, the result of a long historical past, of a modern economy and its accompanying education services concentrated in urban areas at the expense of rural communities and sometimes of the refusal of peoples who are too attached to their traditions to open up to the outside world.

In Latin America, it is towards the Indians, stripped of their land and driven back into the mountain plateaux since the Spanish Conquest, that discrimination is exercised and is made worse by the use of the Spanish language. Yet, in some countries, such as Peru, Guatemala and Bolivia, they form more than half the population.

At the beginning of the twentieth century, Deustua, a Peruvian conservative, claimed: 'What use is there in teaching reading, writing, geography, history and so many other things to these natives, who are not yet human beings?' Seventy years later, the 'general statement' of reform undertaken by the Velasco government (1970) made the following finding, which is also applicable to other countries of Latin America:

'The majority of the population, especially the peasants of the Sierra, has been excluded from the information circuits which would have enabled them to play a fuller part in the national system; by the hermetic nature of the information contained in the circuits given in Spanish, the exclusive national language, the marginalization of these groups has been increased and has become a virtually insurmountable obstacle'.

In the *UNESCO Courier* of March 1979, the Argentine sociologist Hugo Ortega criticized the ethnocentrism and racism conveyed by books published in his country. Everything was presented from the strict 'white' and 'Western' point of view. America was 'discovered', which means 'that the continent, its people and its wealth acquired value only because they were discovered and recognized by the centre of the world, in other words, Europe. It is hardly surprising, then, that civilization (clothes, big ships, white men, and the faculty for naming places and people) should leave America on the sidelines. The earliest inhabitants of the American continent were depicted in a pejorative fashion as half-naked, wild and untamed savages wearing a feathered head-dress, irrational and inferior to the white European … All this amounts to a process of negation and of a kind of cultural genocide'.

The only exception is Mexico: the 1910 revolution recognized the Indian heritage as a component of national history on an equal footing with the Hispanic tradition. The muralists Orozco, Rivera and Siqueiros addressed the people and their cultural heritage directly. A Department of Indian Affairs was created, followed in 1948 by an Indian National Institute, with the aim of studying the problems of Indians and catering to their needs. It organizes literacy and education campaigns that use indigenous languages before going on to Spanish, and provides instruction on agriculture, hygiene and civics. Its action, however, is limited by a low budget and insufficient resources and serves more a purpose of acculturation-deculturation linked to capitalist development rather than genuine cultural pluralism. Compared with the other countries of Latin America, Mexico sets itself apart more by its discourse than actual practice. This is why all over the continent indigenous peoples are rising up in protest, demanding justice and recognition of their existence and their rights. They denounced the celebration of the five hundredth anniversary of the 'discovery' of America in 1492 and turned it into a year of mourning: 'Our History is not yours. It is an unofficial history which did not necessarily start five hundred years ago', declared Rigoberta Menchú, a descendant of the Mayas, who was awarded the Nobel Peace Prize in 1992.

In Africa, the West penetrated the continent from the seaboard and moved towards the interior. People living on the coast were thus the first to have access to modern education, although influences of a sociological nature (the degree of individual mobility in the traditional system) and religious nature (the activity of missionaries, the resistance of Islam) also played their part. For instance, in Ghana in 1960, the south of the country, which represented 47 per cent of the population, accounted for 64 per cent of all boys and 77 per cent of all girls in the secondary education system; the centre (21 per cent of the population), 28 per cent and 20 per cent respectively; and the north (31 per cent of the population), 6 per cent and 2 per cent respectively.[18] Similarly, in Côte d'Ivoire in 1963, there were almost three times as many Agni from the south-east of the country in secondary education than their proportion of the total population, and for the lagoon peoples this figure was two and a half times; as for the centre, the Baoulé represented 19 per cent of the population and 16.6 per cent in secondary education; and in the north, the figures for the Senoufo were 19 per cent and 6.4 per cent only.[19] Madagascar, however, presents an entirely different situation. The Merina of the central plateau, which was the cradle of the ancient Malagasy Kingdom, had themselves introduced schools and the Roman alphabet from the beginning of the nineteenth century, and continue to occupy the preponderant position in education today: while they represent one-

quarter of the population, they account for 70 per cent of enrolments at the primary level and for 60 per cent at the secondary level.

Paradoxically, the policy of national integration that has been pursued since independence has had the effect of making inequalities and tensions worse in many African countries. For example, employment in public services is based on 'merit', yet the main criterion for such merit is the diploma, which gives the advantage to those who have had extensive schooling. Even though enrolment ratios are now progressing more quickly in the interior and in rural areas, absolute numbers are still increasing more in economically advanced and urbanized coastal areas.

The inequalities between urban and rural areas, to which social, regional and ethnic inequalities are partly linked, are also greater in the developing countries than in the developed countries. They stem from a variety of causes: historical, geographical (the scattered population), pedagogical (qualified teachers prefer urban areas for career opportunities, the education of their children, the amenities and leisure-time activities), and perhaps above all social. The governing class lives in the main urban centres; having been trained by the West, this class has adopted its growth model, which gives preference to cities, the symbol of modernity, at the expense of the countryside, which has the image of backwardness. The priority that is thus given to urban infrastructure and services reduces the expenditure on rural development. Yet the rapid growth of cities has its corollary: the even more inordinate growth of shantytowns and of a marginal population whose young people are disadvantaged. It is among these people that absenteeism and dropping-out from school, unemployment and delinquency are most commonly found. Rural schools, which are fewer in number and often do not provide the full programme, cannot take in all the children and only offer an education that is generally limited to three or four years, sometimes even less. This is one of the causes of the school wastage for which figures were given above. These inequalities represent a waste of intellectual potential and money, since three or four years' study is not sufficient to allow children to acquire a lasting knowledge of the mechanisms of reading, writing and calculation. If they live in an environment offering no or little education, they will very soon return to illiteracy.

One last type of inequality, which is by no means the least important, is that between girls and boys. If only figures are considered, this inequality has virtually disappeared in the developed countries, but persists elsewhere, and increases as the education level rises: enrolments for girls range from 45 per cent at the first level to 47 per cent at the second, and 38 per cent at the third. These averages, however, obscure more or less marked disparities depending on the continents and states, and also regions within states.

What has not disappeared and is still universal are the prejudices, stereotypes, discriminatory attitudes and behaviour patterns towards women (known as sexism). This has the effect of demeaning girls and women in relation to boys and men, and reducing their participation in family, occupational, social and public life. Feminist movements were the first to denounce this situation. In order to take appropriate action, UNESCO has supported this struggle by launching a study programme on sexism in children's books and school textbooks, while the United Nations has been mobilizing world opinion by organizing World Conferences on Women in Copenhagen (1980) and Beijing

(1995) under the triple banner of Action for Equality, Development and Peace.

Seven national studies were carried out (in China, France, Kuwait, Norway, Peru, Ukraine and Zambia) and were followed up by regional guides prepared for the Arab world, Asia and the Pacific, North America and Europe. In her synoptic report, Andrée Michel drew a parallel between racism and sexism.[20] The two are the consequence of historical situations and result in legitimizing and maintaining practices of domination, oppression and exploitation towards an ethnic group or a gender that is assumed to be inferior. Women account for half of the world's population, perform 66 per cent of all hours of work (only half of which is remunerated), receive only 10 per cent of world income and own less than 1 per cent of the property. They represent only a tiny minority of 'decision-makers' on a national and international scale.

Stereotypes are everywhere and exercise a constant influence, right from early childhood: in the family, where children perceive the division of labour between their parents, and where the latter have a different attitude towards the former depending on gender (starting at birth, and continuing with food, games, education); in peer groups, which also encourage different activities according to gender; on the labour market, where jobs that are regarded as 'feminine' are less prestigious and less well paid (nurses/doctors, etc.) and where the top posts are usually reserved for men; and in political life, where the inequality of roles is conveyed and amplified by the media. Books for children and adolescents also convey sexist ideologies through images, the presentation of occupations and the ranking of family, social and political orders, and the glorification of heroes who are more often men than women.

Schools, as social institutions, are bound to be affected by the explicit and implicit values and norms of their environment. In fact, they are one of the most effective transmitters of society's values and norms. In particular the exteriorization of male and female roles occurs under the influence of school textbooks, which, like children's books, act through illustrations, references, and their way of dealing with a subject. Regardless of the discipline, whether it be science, literature, history, religion or some other subject, and regardless of the country, there are always more pictures of boys and men than of girls and women, and more male than female references. In Norwegian and French science textbooks, the men are more active and are more often to be seen at places of work or practising sport. Women are represented when it comes to showing electric hair-dryers and bathroom scales. Women are only wives, mothers or housewives. In Peruvian primary school textbooks, men are described as brave, intelligent, patriotic and having a sense of co-operation, while women are obedient and devoted. The home is their privileged place, while the world of work is essentially for men. Similarly, the textbooks used in Zambian primary and secondary schools describe men as being 'more intelligent, more creative, having a greater sense of curiosity, more inventiveness and daring than women … Men take the decisions and lay down the law. Women follow and obey.' In the Arab countries surveyed – Lebanon, Egypt, Saudi Arabia, the People's Democratic Republic of Yemen, Qatar and Kuwait – women are always represented in accordance with the traditional image, dependent on men for their economic welfare and their social status. Weak, sensitive, and submissive, they fulfil their role best by

scrupulously performing the functions and duties expected of a mother, housewife, spouse, and obedient and devoted daughter. Socialist Ukraine is the exception in that it presents almost as many female figures as male, and their individual features are carefully drawn. Women are shown as having positive aspects more often than men. However, the stereotypes have not disappeared altogether. Sometimes the features of each sex are exaggerated to portray activity, efficiency, courage, reason, for one, and passiveness, affection, concern, etc., for the other. In textbooks of other countries, traditional roles are portrayed, such as women in the home or in secondary activities and men as the heads of the family exercising responsibilities.

All these stereotypes transmitted in the family, at school and in society have the effect of giving girls feelings of inferiority, deterring them from scientific and technical studies, and limiting their job aspirations. This means that society is not only not applying the principles of equality of opportunity for men and women, but also depriving itself of considerable intellectual potential.

**Education and cultural development**

Cultural development can be defined as the development of the knowledge, values and attitudes that permit the fulfilment of people's personalities and creative capacities.

Defined in these terms, 'cultural' development cannot be readily distinguished from 'social' development, as the example of the education of girls has just shown. It is both individual and social, since all individuals are members of a society and their development contributes to that of the group as a whole, especially since their whole being with all its different aspects – emotional, intellectual, physical, moral and aesthetic – is involved.

In history, every society, depending on its way of life and communication (oral or written), its religion or ideology, has dwelt on one particular aspect or another. At the present time – owing to the predominance of economic, scientific and technical activities – schools everywhere are to varying

degrees intellectualist, notwithstanding some isolated exceptions. Most schools tend to give priority to cognitive development and make use of authoritarian methods aimed at imposing their views; hence repetition, rather than initiative and criticism, is the rule. The outcome is an imbalance in children's personalities in favour of the conceptual view and to the detriment of imagination and emotion. In addition, schools tend to shed a favourable light on their culture, which is the culture of the dominant class and has little room for other views of the world and society: schools are ethnocentric.

In UNESCO's *Statistical Yearbook 1995*, the heading 'culture and communication' includes the following: book titles published, daily newspapers, cultural paper (newsprint, printing and writing paper), production of long films, number of and seating capacity of fixed cinemas, cinema attendance, radio and television transmitters and receivers. Since 1955, all these indicators have increased in the developing countries and the share of the developed countries has accordingly decreased, although still preponderant. The trend from 1980 to 1990 is shown in Table 19.

It is true that a statistical yearbook, by definition, only provides quantitative data, whose content and relevance should be questioned: the media can inform as much as they can disinform. However, the above list gives a fair reflection of the habitual notion of cultural development, which takes it to be a consequence of economic growth. It is assumed that such growth makes it possible to increase cultural goods and services whose consumption rises with the standard of living. In actual fact, the surveys that were conducted in Canada (1973), France (1974) and in the former Soviet Union show that these cultural goods and services involve only a small minority of the population: 14 per cent in Canada and 10 per cent in France. In Canada, for example, the theatre attracts 10 per cent of the population; opera, less than 2 per cent; ballet, 1 per cent; classical music concerts, 6 per cent; and museums, monuments and art galleries, 8 per cent. On the other hand, more than half the population goes to jazz and pop music concerts, variety performances and circuses, festivals, the

*Table 19*  **Cultural indicators 1980–1990**

| Cultural indicator | 1980 | | 1990 | |
|---|---|---|---|---|
| | Developing countries | Developed countries | Developing countries | Developed countries |
| Number of radio receivers per 1,000 inhabitants | 98 | 879 | 177 | 954 |
| Number of TV receivers per 1,000 inhabitants | 25 | 422 | 56 | 480 |
| Circulation of daily newspapers per 1,000 inhabitants | 37 | 242 | 44 | 331 |
| Publication of books (titles) per million inhabitants | 46 | 490 | 60 | 488 |
| Consumption of cultural paper (excluding newsprint) per inhabitant (in kg) | 1.4 | 26.6 | 3.1 | 47.7 |
| Public libraries: number of volumes per 1,000 inhabitants | 80 | 2,930 | 170 | 3,850 |

*Source:* UNESCO, 1995, *Statistical Yearbook 1995*, pp. 63 et seq. International Bureau of Education *Statistical Document on Education and Culture*, Paris.

cinema and sporting events, and everybody seems to listen to the radio and watch television.[21]

On this last point, regarding radio and television, the situation is the same elsewhere. However, these media are capable of the best and the worst. They make it possible to see and hear invaluable documents of the historical and religious, artistic, literary and musical heritage of humanity, providing a wealth of information and instruction. Unfortunately, this kind of programme represents a minor share of what people listen to or watch, compared with the share dedicated to so-called 'mass' culture, which leads to a deculturation of the public because it is subject to the demands of profitability (and of propaganda, both open and insidious, not only in places where dictatorship reigns), and its contents are of a very poor standard, conveying half-truths or commercial or political lies, myths on democracy, pluralism and their own neutrality, all aiming to blunt the critical spirit and maintain the social *status quo* to the advantage of those who exercise economic and/or political power.

The role of the state in cultural affairs varies with the political system (authoritarian or liberal, centralized or decentralized), the importance of private organizations, the economic level, the level of education of the population, and recognition or not of the right to culture written into the Universal Declaration of Human Rights. Most countries endeavour, with varying degrees of success, to preserve and protect their cultural heritage, foster artistic creation and expression, and encourage reading and the appreciation of artistic, literary and musical works. This is promoted both at school and in society, with the assistance of associations and enterprises, and through the intermediary of the media, museums, libraries, etc. A growing number of schools are also opening up to other cultures.

Education for mutual understanding and peace, which is written into the Universal Declaration of Human Rights, has long formed part of UNESCO's programme. From 1953 onwards, it established a network of Associated Schools whose purpose is to contribute to the Organization's efforts by emphasizing world problems and the role of the United Nations, human rights, knowledge of other countries and their cultures, people and their environment. UNESCO encourages the development of new teaching contents, materials and methods on these themes, the dissemination of information, and agreements and exchanges between participating institutions, for which it provides basic documentation and helps organize workshops and seminars. Starting with 33 secondary schools in 15 states half a century ago, by 1992 the network had grown to more than 28,000 schools at all levels in 114 countries.

In 1968, the International Conference on Public Education meeting in Geneva unanimously adopted the following recommendation:

> Education should help to increase a knowledge of the world and its peoples and to engender attitudes which will enable young people to view other cultures, races and ways of life in a spirit of mutual appreciation and respect. It should make clear the relationship of environment to patterns and standards of living. While providing an objective treatment of differences, including differences in political, economic and social systems, it should bring out the common values, aspirations and needs in the life and conscience of the world's peoples.

> Education should show that the advancement of human knowledge has resulted from the contributions of the various peoples of the world, and that all national cultures have been and continue to be enriched by other cultures.

This recommendation clearly sets out the purposes of education for international understanding. Education on human rights and the rights of peoples is an integral part of this education, since it is not possible to aim for international understanding if these rights are not recognized: it is obviously necessary to define them, examine their origins and their historical development, and see how they are presented in present-day societies. The Universal Declaration of Human Rights has defined human rights, while the rights of peoples have emerged more recently with national liberation struggles and the struggles for economic, social and cultural development. International understanding includes that of immigrant minorities whose culture is demeaned because they are often composed of manual workers doing jobs that are themselves demeaned. The unwillingness to understand different cultures, especially by cultures which regard themselves as 'superior', stems from factors that go by the name of ethnocentrism, ideology, nationalism and racism, In some countries, this holds true for the dominant ethnic group and the attitudes it has towards the ethnic groups it dominates.

How is it possible to provide education for international understanding, respect for cultures, human rights and the rights of peoples and democracy? This effort, which has to include adults and children alike, should be focused on three main areas:

- The training of teachers and adult instructors, particularly those responsible for multi-ethnic classes: Since culture is a whole, the idea is not to separate out a particular characteristic, which is then compared with the corresponding characteristic of a person's own culture, but to see how the culture as a whole functions and how its different elements are interlinked.
- The learning of foreign languages represents an introduction to ways of life and civilizations; moreover, it is an excellent mental exercise and meets the needs of present-day communication.
- The revision of syllabuses and textbooks in order to include the study of the major works of the literatures and arts of humanity, and eliminate stereotypes and the historical bias that impede an objective view of differences, mutual tolerance, and an awareness of universal values and the need of peoples to borrow from each other's culture, which is more important for their life and development than participating in international conflict or war.

In spite of these international recommendations, the question of multicultural education has actually arisen only recently in developed countries. Until the 1960s and 1970s, the prevailing approach was one of unifying culture and education, aiming to address the issue through assimilation. In the United States, a nation of immigrants, the common school was regarded as the melting pot, in which ethnic, linguistic and religious differences were expected to be merged in order to produce an American citizen. What this meant, in fact, was integration into the dominant WASP culture (White Anglo-Saxon Protestant). Similarly, in the multinational Soviet Union, which recognized the right of

each people to cultural autonomy and whose Constitution made no reference to a national language, unification (indeed uniformization) was brought about through the use of Russian in teaching, communist education, ideological control and repression of 'petit-bourgeois nationalism'. In Western Europe, the issue focused on the immigrant workers who came from the South during the major period of expansion after 1945. Regardless of whether the minorities are national or immigrant (and part of the latter may remain immigrant or become 'national'), the differences of language, religion and customs create sources of tension and conflict, which frequently result in violence, especially in periods of depression and unemployment. In the Soviet Union, the resurgence of national and religious sentiments was one of the factors in its collapse. In the United States (Plate 166), the discrimination that persisted following the adoption of the Civil Rights Bill (1964) resulted in the radicalization of demands: the African-Americans, Native Americans, Chicanos, Irish and Jews all vehemently asserted their identity and denounced the injustices of the social system. With one-quarter of the population presently composed of minorities (African-Americans, Native Americans, Latinos, and Asians), it is estimated that this proportion will rise to almost one-half by the year 2050 as a result of their fertility rate being higher than that of Whites. This has led to greater receptiveness on the part of the latter to intercultural communication and exchange, abandoning the *melting pot* ideology and acknowledging that pluralism and tolerance are elements of democracy. Since 1968, the law grants minorities the right to bilingual education: while English has priority, the language of origin enjoys continuous support. However, some groups, chiefly African-Americans, Native Americans and Latinos, are demanding separate schools, or at least different curricula, that will no longer give preference to Eurocentrism but grant an equal place to other cultures, in particular to Africa, and examine the phenomena of oppression, exploitation and racism in American society.

In Europe, the development of multicultural education appears to be less advanced as a result of older and stronger national (nationalist) traditions, the myth of mono-cultural society, and the recent nature of multi-ethnic situations. In this case, the term 'multicultural education' refers primarily to the schooling of immigrant children. Until the 1970s, when immigrants were still few in number in an expanding economy, the policy was one of assimilation combined with some measures to facilitate the learning of the national language. The oil crisis and its consequences brought a halt to immigration (which was offset to some degree by the inflow of political refugees), but did not prevent an increase in the number of pupils from immigrant families. In 1988, they represented between 5 per cent (Netherlands) and 40 per cent (Luxembourg) of the numbers enrolled in primary schools (France and Germany, 12 per cent; Belgium, 10 percent; Sweden 13, per cent).

According to a report to the Council of Europe (1989)[22] the countries which have allocated the most funds to the schooling of children of immigrants (although the overall amount is still modest) are France, the Netherlands, the United Kingdom and Sweden. Policies, however, are very varied. France, with its centralizing and secular traditions, its conception of the 'Republic one and indivisible', where the French language plays a major political role, unloads the languages and cultures of the 'Other' (including those of its

provinces) onto the private sector. State-run schools take in all children on an equal footing without any discrimination and without granting them any special measure according to their origin, apart from newcomers, who can enrol for a year in a (mainly linguistic) introductory or adaptation class. The training and information centres, which train teachers for these classes, occupy a marginal place in the general teacher-training system. Courses on the language and cultures of the countries of origin may be given after school hours by teachers paid by those countries' governments. The principle of equality is formally and strictly respected, but in view of the failure to take account of the specific difficulties of immigrant children, it does not respect their right to be different and contributes to their failure at school or even to their exclusion (the prohibition of the 'Islamic veil' in schools). The Netherlands is the only European country to have included intercultural education as a compulsory subject in teacher training.

With the construction of Europe, which has focused on the economic and political spheres as the basis of its identity, a new issue is emerging. The European Union is now discovering the importance of education, for which no provision was made in the Treaty of Rome (1957), since the European Economic Community was only empowered to deal with training. Rising unemployment and the growing awareness that it is lagging behind the United States and Japan in technology has prompted a new attitude. The single market implies the existence of qualified human resources capable of increasing productivity, to which the mobility of individuals and ideas, in other words reciprocal knowledge, has to contribute. The most dynamic companies are encouraging this approach, as are a variety of European programmes. For example: Comett aims at enhancing high-technology training by encouraging co-operation between universities and industry; Erasmus fosters exchanges of teachers and students, with the logical sequel being the mutual recognition of diplomas (making it possible to become professionally established in another EU country; and Lingua sets out to help enterprises improve the language skills of their employees, to develop language teaching, in particular teacher training, and to intensify exchanges between schools. The Single European Act, signed in Maastricht in 1986, gives the European Community limited jurisdiction in the field of general education. In spite of a large number of resolutions aimed at developing the 'European dimension' in education, teacher training, and teaching materials, and the creation of a Special Unit to organize summer universities, exchanges of teachers (TEX) and networks of trainers (RIF), progress is still slow. Not only are all the nationalist tendencies opposed to multicultural education, but even those in favour of a united Europe interpret it differently.

What has to be noted in the developing countries is the demand for, or assertion of, 'cultural identity'. This comes after a period when the strength of the Western development model prompted the majority of the elites to think that traditional values were out-of-date and incapable of renewing their societies, and that it was thus necessary to adopt and emulate the culture of the West in order to be freed of its domination.

The term 'cultural identity', however, is used in a very vague sense, which is more political than scientific since, strictly speaking, doubts can be raised about the existence of a cultural identity transcending social classes, regions and

ethnic groups (in multi-ethnic states, i.e. virtually everywhere). Political discourse makes use of this term to designate a certain way of thinking, feeling and acting, a certain set of values, attitudes and behaviour patterns which states want to protect from the uniformization of 'mass culture' disseminated by the media on a worldwide scale. In their view, education must strengthen the awareness of belonging to a community while opening up to outside currents. 'Cultural identity' does not mean withdrawal into the self.

It is above all Africa and the Arab States that stress cultural identity. This is probably because, being situated close to Europe, they have been subject to aggression from European imperialism: in particular, the oral tradition of Africa makes its civilization more fragile than others. However, the discourse promoting cultural identity is hardly reflected in reality. African languages, which are an essential factor in culture, are only used in some countries in the first years of primary education or for literacy training. Generally, right from the start, the vehicle of instruction is French, English or Portuguese. Yet language is not only a means of expression and communication, it is at the same time a system of symbols, which binds individuals closely to their group. Hence, the mother tongue is the best vehicle for education, since it enables people to learn more rapidly and better than in a foreign language. The foreign language cuts off children from their environment, the 'elites' from the mass of the population, and contributes to creating 'two nations' within the same country.

It is true that making the mother tongue the language of instruction can also pose objective difficulties: the large number of ethno-linguistic groups, the lack of a written literature, textbooks and teachers, the high costs, etc. Many political figures contend that the use of French, English or Portuguese contributes to national unity, which is debatable and which, in any event, contradicts their declarations in favour of the regeneration of their country's culture and personality. In reality, the problem is social and political. Education in a foreign language favours sections of the population that are acculturated in that language, in other words the socially privileged sections. They use the foreign language as an instrument to select those emerging from other social levels and hence restrict their advancement (in sub-Saharan Africa, 10–30 per cent of children in primary school go on to secondary education).

In the view of many educators, the problem of the democratization of education while maintaining relevance and effectiveness can be resolved by adopting bilingualism. Education would start in the mother tongue. When children have mastered its mechanisms, they would then go on to English, French or Portuguese, which would first be taught as a foreign language before being used as a vehicle in subjects for which the national vehicular language cannot yet be used. This language will continue to be used to explain the foreign language and to link children to their environment. Some countries do not have a clear-cut cultural policy and hardly concern themselves with cultural infrastructures, such as museums, archive services and libraries, or with the preservation of their heritage (by collecting traditions), research and publishing. In schools, culture is above all included in the teaching of history and geography. Art, music and theatre occupy a very small part in the timetable, or no part at all. The teachers who deal with these subjects are usually not very qualified and have

had no training. However, some universities are more active in this area, and the research and publications that have resulted are due more to their initiative than to that of governments.

In the Arab countries, the language does not, at first sight, appear to pose a problem since it has been written for the past 14 centuries as the language of the Koran, the foundation of unity for all Muslims, and as the language of a highly developed culture. The problem is that classical Arabic is different from the spoken language, and this creates difficulties for people from lower-class and rural backgrounds, and also for non-Arab speakers such as Berbers and Black Africans, who sometimes form a substantial proportion of the population (Morocco, Algeria, Mauritania, Sudan). However, the policy of national integration pursued by governments since independence, in reaction to the 'divide and rule' policy of colonization, has ultimately had the effect of more or less excluding minority cultures, and inciting people to demand the right to have their identity recognized.

Another problem arises when a foreign language, English or French, is used as a vehicle for instruction in secondary and higher education, sometimes in primary school (the Maghreb). The consequences from the social standpoint (wastage) are made worse by the fact it is also a 'quasi-official' language in the administration and economy, and this works to the disadvantage of graduates in Arabic. The dilemma is that English or French are essential for giving access to science and technology, which are an integral part of modern culture.

The question of cultural identity is also raised in Latin America, where Porfirio Diaz's phrase concerning Mexico – 'So far from God, so close to the United States!' – can be applied. Yet this explains only some of the difficulties of this continent, where political violence and social injustice have been greater than elsewhere. Although a process of constitutional democratization has been under way since the 1980s, the social and ethnic inequalities (which are often combined) continue to be crucial problems. A growing minority of public opinion has become aware of this, especially after the victory of Castro and the socialist transformation of Cuba, and notably within the Church, which was long associated with the Spanish conquest and with the domination and exploitation of the Indians. Two movements, whose importance lies more in their significance than in their actual dissemination, should be noted: literacy through consciousness-raising and liberation theology.

The first is linked to the Brazilian philosopher Paulo Freire. He starts out from the idea that culture is something created by people through their work. However, illiterates are oppressed (they cannot vote). If education is to be a form of liberation rather than of domestication, it has to make them capable of showing critical awareness in relation to their living conditions. It has to make them discover, by a method based on participation and dialogue, that they are responsible subjects and not passive objects and that they have an active role to play in their environment. The illiterates themselves then feel the need to learn to read and write in order to be able to act more effectively and change reality: literacy training can then begin. It is through self-instruction, progressing from the interior to the exterior through the illiterates' own efforts, with the support of the educator, that the content and the method are merged in a single process.

Instead of in schools, which are by tradition authoritarian, literacy training takes place in *culture circles*. These meet around a coordinator of literacy learners, with whom they draw up an inventory of their verbal universe. It is from this universe, rather than from pre-prepared primers, that they draw on key words. Breaking these key words down into syllables makes it possible, by different combinations of their components, to create other words. The words are chosen not only for their phonetic richness and complexity, but also for their content of real-life experience. Terms like *favela* (shantytown), *chuva* (rain), *arado* (plough), etc., appear in tables showing practical situations and give rise to discussions which prompt the group to 'raise its consciousness' and, concomitantly, to become literate.

Thus, consciousness-raising and literacy go hand-in-hand. Because they have become conscious of their status as *people*, illiterates can critically assimilate the mechanism of forming words and they can thereafter easily elaborate their system of graphic signs. Paulo Freire recounts that, in the first evening of literacy training, one illiterate in Brasilia moved everybody present by saying 'Tu jà lê', the Portuguese equivalent of the phrase 'You are reading already'.

At the same time, the 'Basic Education Movement' of the bishops of Brazil (1961) put forward grassroots education as 'an instrument of human advancement … without evangelical purposes'. This made an improvement to the quality of life of the rural population and 'preserved them from the penetration of ideologies contrary to Christian principles'. Under the influence of progressive groups in the clergy and the active participation of the Catholic University youth movement, the Basic Education Movement adopted both the idea of 'Christian education as a means of social transformation' and the 'consciousness-raising' view of Paulo Freire.

Slightly later, after Vatican II and the encyclical *Populorum progressio* (1967), liberation theology appeared in Peru. Father Gustavo Gutierrez defined its three closely linked dimensions: political liberation from dominant classes and countries; historical liberation; and liberation from sin which is not only individual but also collective. While the Protestant Ecumenical Council of Churches also condemned the 'structural violence coming from the established power', a further step was taken at the Conference of Accra (1977), where the Association for Ecumenical Dialogue of the Theologians of the Third World forcefully asserted that African (Asian, Latin American) theology should 'reject the prefabricated ideas of North Atlantic theology' by aligning with the struggles of the people in 'the resistance against the structures of domination'.

It is against this background that some of the experiences of non-formal education for rural people that were organized by or with associations should be understood. Mention will only be made here of the 'Programa de difusión rural' in Chile, which is particularly interesting since it operated under the dictatorship for several years (1977 to 1981). Radio broadcasts and press articles (e.g. *Cuadernos del Campesino*) focused on the problems of the rural world (production, health, family life) and aimed at 'strengthening the values of solidarity in an environment which exacerbates individualism' and showing that cooperative organizations make it possible for the moderate classes to 'tackle the process of production in better conditions'. In spite of the fact that it was short-lived, the programme provided peasants with information that had previously been inaccessible to them, fostered communication between them through knowledge of the problems of other regions, and developed a critical awareness.

Liberation theology is for the moment still a minority current, and religious authorities on the whole collaborate with government authorities rather than oppose them. However, the pressure of Indian demands has prompted certain governments (Ecuador, Bolivia, Peru, Guatemala, Mexico) to develop bilingual education. Evaluations made of bilingual education show that it has positive effects on the level of acquisition, and that introducing elements of indigenous culture into the programme enhances motivation, resulting in a reduction in wastage. Nonetheless, three obstacles need to be overcome: the lack of standardization in Indian languages; their variations across the country, which entails research to demarcate their areas of application; and, above all, a resistance to the generalization of intercultural education, which is considered to be exclusively for Indians. Countries as a whole, however, should be concerned with fostering a spirit of understanding and respect for the other. Isolating the intercultural dimension from the education system 'perpetuates the vicious circle of marginalization which affects the Indian populations'.[23]

Asia is the continent that has made the most progress in economic terms over the past 30 years. It is also a continent where the environment has seriously deteriorated and where traditional values have suffered the most brutal shock from rampant materialism. All the international conferences of ministers of education have voiced their concern over this and expressed the need to draw up a policy aimed at inculcating ethical, cultural and moral values. The question is how 'tradition' can be reconciled with 'modernization', in other words capitalism, the profit motive, the exaltation of the individual, etc. Moreover, once the values to be taught have been identified, how can they be taught – directly as a 'subject' like literature or mathematics, or indirectly in analyses of situations, case studies or discussions? And is it possible to teach values when reality appears to contradict them (corruption, abuse of power, injustice)?

The problem is easier to resolve when it comes to developing scientific and technical education indispensable for economic growth. To various degrees, all countries seek to adapt the structures, contents and methods of education to the fast-moving changes of technology in order to increase their productivity and their international competitiveness. Stress is laid on the polyvalent nature of education, links with industry, continuous education and the development of research. Project 2000+ aims to create a framework for extending the benefits of 'scientific literacy' to the entire population or at least to the labour force, without which the efforts of managers would be futile. It is known that the transfer of technology is effective only if qualified personnel – who have the necessary knowledge, social and psychological attitudes, and working habits – are available locally, in other words, people who master the technology transferred. However, this transfer provides only short or medium-term solutions, as it transfers knowledge and methods elaborated in the outside world, in that world's conditions. The transfer does not provide the capacity to produce knowledge. Yet such a capacity is essential. Without it, countries will always remain dependent on the outside world, with all the risks of political and economic domination that this entails.

## NOTES

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# 29

## INFORMATION AND COMMUNICATION

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## 29.1

### A NEW INTERNATIONAL INFORMATION ORDER

*José Antonio Mayobré*

**INFORMATION AMONG NATIONS**

The gathering, processing, possession and – ideally – sharing of information, is the basic lifeline that allows people to organize, survive and perhaps even thrive as members of a community; it also permits nations to communicate with each other, have commercial and cultural intercourse, collaborate among themselves and sometimes avoid war.

Information is at the heart of communication, it is its *raison d'être*. The basic object of communication is to transmit information from one being to another and in transmitting such information to share it, to put it in a common space. Throughout history those who have gathered and processed information have been aware that its possession provides them with the power of knowledge over those who do not have it.

As with individuals, so it is with institutions and nations. The control of information and of the channels used for making it available to others has meant power, and those who hold it have not always been willing to part with it.

One definition states that 'Communication maintains and animates life. It is also the motor and expression of social activity and civilization ... Communication integrates knowledge, organization and power and runs as a thread linking the earliest memory of man to his noblest aspirations through constant striving for a better life.'[1]

According to a most authoritative if still controversial source, communication is at the heart of all social intercourse. Whenever men have come to establish regular relations with one another, the nature of the systems of communication created between them, the forms these have taken and the measure of effectiveness they have attained have largely determined the chances of bringing communities closer together or of making them one, and the prospects for reducing tensions or settling conflicts whenever they have arisen.

M. Amadou-Mahtar M'Bow, the former Director-General of UNESCO, also stated that thanks to the rapid development of communication technologies, every nation now forms part of the day-to-day reality of every other nation. The world continues to become increasingly interdependent. This interdependence however, goes hand in hand with a host of imbalances and sometimes gives rise to grave inequalities, leading to the misunderstandings and manifold hotbeds of tension which combine to keep the world in ferment.

Thus, throughout history, the development of information distribution channels was designed, and took place, in what was fundamentally a unidirectional and unilateral fashion. Information was sent from the seat of the 'mother' nations to the colonies, for the purpose of serving the imperial administration and nationals, and for providing 'knowledge' and 'culture' to those colonials willing to adapt and be assimilated by the dominant culture.

Information from the colonies to the central power was basically designed to further the commercial and political interests of the home power, and took little if any account of the needs and realities of the colonies except where this could further strengthen the imperial hold on the colonial outposts.

And just as all roads led to Rome, so did the telecommunications systems with their cables, lines and other facilities developed during the last half of the nineteenth century and the early years of the twentieth century lead to the dominant political centres and only through them to the nations that would later be known as the Third World.

The first clear warning about the dangers and inequalities inherent in this system came from the United States, where the Associated Press news agency denounced the fact that when Reuters, Havas and Wolff[2] pooled their resources, established complete news agency control of international news and allotted to themselves the news agency exploitation in all the countries of the world, they brought under their

control the power to decide what the people of each nation would be allowed to know of the peoples of other nations and in what shade of meaning the news was to be presented, and that 'International attitudes … developed from the impressions and prejudices aroused by what the news agencies reported'.[3]

The rapid development of new communication technologies after the Second World War and in particular after the 1960s tended to follow the patterns established earlier for the channels allowing the flows of information. With the Cold War and the presence of two dominant and radically divergent ideological models in the world, a debate arose as to the importance of freedom of information and of the free flow of such information.

What was established early on was that information could flow as freely as it wanted, but that the existing infrastructures that allowed this flow made it in practice a one-way current favouring those who controlled the technological means and media, and thus reinforcing and strengthening in fact the situation denounced in the 1940s.

The advent of global radio and, in particular, television changed in many ways the predominance of the print medium and of the agencies, but on the other hand reinforced the position of the central powers in that the new audiovisual media usually bypassed the local political elites to influence mass audiences directly.

At the same time, the economic realities of the media and information industries were leading to a synergistic process where concentration of ownership became the norm at the level of multiple media outlets, thus reinforcing the possibilities for control of message contents and – because of the commercial nature inherent in the way the system was developing in the West – for the predominance of a vision where 'information' was to be considered a product for marketing and profit-making rather than as a social good or even as a human right.

Not until the late 1960s was the concept of communication as a human right advanced. In 1969, the Frenchman Jean D'Arcy wrote that the Universal Declaration of Human Rights would 'have to involve a more ample right than that of the individual's right to information … and that right is the right that the individual has to communicate.'[4]

And as with individuals, so with nations. While communications technology was developing during the 1960s and onward, the world was undergoing a rapid process of decolonization and, over a matter of relatively few years, a host of newly independent nations appeared and quickly became conscious of the role they should play in the international scene.

The creation of the Non-Aligned Movement and of the Group of 77 was a harbinger of a new configuration where the so-called Western and socialist blocs of nations would have to contend with an active and assertive Third World.

## EFFORTS TO ESTABLISH A NEW INTERNATIONAL INFORMATION ORDER

While the debate on the New International Economic Order (NIEO) was reaching its apex in New York during the summer of 1975, with the approval by the seventh extraordinary session of the General Assembly of the United Nations of a Plan of Action for its implementation, the discussion between the nations of the North and the

South was beginning to gather momentum on the matter of information and communication.

These were not new topics on the international agenda. As Nordenstreng has pointed out, the issues were already a subject of concern to the world community by the 1950s and, as regards, for example, the global imbalance of information structures and flows, one could already find clear criteria about them and their effect on diverse cultures early in the century.

The United Nations and UNESCO had addressed the issue of information, approved resolutions in its regard and even called for 'a concrete programme and plan of action in this respect'.[5] In 1953, the UN secretariat had already published a report entitled *Freedom of Information* while UNESCO contributed to the topic with *Encouragement and Development of Independent Domestic Information Enterprises*.[6]

But as the nations of the Third World began to take notice of the limitations imposed on them by the international information and media structures, it became clear that a New International Economic Order could not really become a reality without the parallel creation of a New International Information Order.

As an important student and actor in the process explains, by the early 1970s, the developing countries had accumulated a great deal of political power and economic potential with the assistance of such organizations as the Movement of Non-Aligned countries and OPEC. As a political programme and an intellectual concept, decolonization was well established by this time. But before 1973, the idea of decolonization was not applied in an articulated and authoritative manner to the sphere of information and culture. This occurred at the fourth Conference of Heads of State or Government of the Non-Aligned Countries, in Algiers, when the political declaration of the Conference made the point that 'the activities of imperialism are not confined solely to the political and economic fields, but also cover cultural and social fields' and demanded 'concerted action in the fields of mass communication' as a part of the Action Program for Economic Co-operation.[7]

In 1975, in the context of the seventh extraordinary session of the United Nations General Assembly, convened to discuss the Plan of Action for the NIEO, a group of Third World journalists declared that 'The New International Economic Order requires a new world structure of information and communication.'[8]

According to Nordenstreng, it was in 1976, at the Non-Aligned Symposium of Information, in Tunis, that the phrase 'new international order' was first applied to information. There, in the report of Commission I written by the Peruvian Germán Carnero Roque, it is stated that 'Since information in the world shows a disequilibrium favouring some and ignoring others, it is the duty of the non-aligned countries and the other developing countries to change this situation and obtain the decolonisation of information and initiate a new international order in information.'[9]

## THE ACADEMIC DEBATE

As the political debate took place in international fora, so did the theoretical discussion regarding the various theoretical approaches to communication and its role in society. Until the 1950s and early 1960s academics working in the field of communication had been 'led' or even

overwhelmed by the sheer volume of research coming from what was known as the American 'mass communication research' school, which viewed communication problems from a 'functionalist' point of view and, later, strongly proposed a diffusionist approach according to which the establishment of media in developing countries was simultaneously a sign of and a means for 'progress' – with the latter understood as coded language for approaching the 'American way of life.'

Until the 1960s, UNESCO had favoured the diffusionist approach, with notable figures such as Wilbur Schramm and Daniel Lerner leading the way. But as the decade progressed the influence of the critical thinkers in communication began to make itself more assertive, in particular as related to the relationships between communication, power and social and economic realities.

Researchers from various parts of the world were convened by UNESCO to exchange views and thus began what is arguably one of the most intellectually fruitful, creative and productive moments of UNESCO in the communication field.[10]

New proposals and approaches coming from various individual researchers (Antonio Pasquali, James Dermot Halloran, C. J. Hamelink, H. I. Schiller, among others) and international non-governmental organizations linked to UNESCO, such as the International Association of Communication Researchers (AIERI/IAMCR) and the Fédération Internationale Editeurs de Journaux (FIEJ), as well as the International Communication Association (ICA), the International Press Institute (IPI), the International Organisation of Journalists (OIJ) and a host of others, led to heated debates, confrontations and discussions which soon escaped from the purely academic framework to be inserted into the North-South differences and eventually into the East-West confrontations.

## STRUGGLE FOR A JUST ECONOMIC SYSTEM VERSUS NEO-COLONIALISM IN INFORMATION

The struggle that was initially seen by some as a search for a just economic system versus neo-colonialism in information was clearly more than that; it involved the role of an increasingly powerful mass media, based mostly in a few industrialized nations, and a new and insidious form of transculturalization being used as an instrument of neo-colonialism not just in, but through, the management of information.

Added to these were the basic ideological differences between the Marxist and capitalist camps as to the role the media should play in society, and thus UNESCO became a battlefield, which would witness many struggles in the following years, of which the following developments may provide an example.

## THE MASS MEDIA DECLARATION

As has been seen, the topic of the media and their role in the relations between individuals and between nations had been an important one over the years, and the United Nations had from the start provided an important forum for the discussions and the search for solutions to the various problems posed in this regard.

One of the most polemical manifestations of this came in 1972, when a proposal was presented to the seventeenth session of the UNESCO General Conference by Belarus and the USSR suggesting the preparation of a 'draft declaration concerning the fundamental principles governing the use of the mass information media with a view to strengthening peace and international understanding and combating war, propaganda, racialism and apartheid'.

Two other topics were discussed at this session, which would soon become part of the debates: the promotion of 'Professional standards in the field of the mass media' and the promotion of 'Codes of ethics' for journalists and media. To these would be added later the 'Protection of journalists,' which also generated fierce debate.

It was not until 1978, after much negotiating and conflict-riddled debate had taken place that the twentieth session of the General Conference approved a compromise text proposed by the Director-General as the 'Declaration on Fundamental Principles concerning the Contribution of the Mass Media to Strengthening Peace and International Understanding, to the Promotion of Human Rights and to the Countering of Racialism, Apartheid and Incitement to War.'

The document was the result of a long, arduous and difficult process over several years that had threatened the very unity of UNESCO at the 1976 Conference in Nairobi; the compromise wording was characterized by the Director-General himself as so moderate that 'nobody can expect to find in it, word by word, the exact draft he would like to see. On the other hand, nobody can say that it runs counter, in any profound sense, to the principles to which he is deeply attached.'[11]

What is most striking about this and the ensuing debates, as related by various observers, is the wide gap they revealed between the countries of the socialist East, the capitalist West and those of the Third World, and how the many differing perspectives became at some points bitterly divisive and led to compromises which, in a less charitable view than M'Bow's, left no one happy and no issues truly resolved.

### The McBride Commission and Report

In response to the heated debate and in search of a consensus following the Nairobi General Conference in 1976, the Director-General of UNESCO, M. M'Bow, created an International Commission for the Study of Communication Problems, presided by the noted Irish thinker Sean MacBride.

The Commission's mandate was 'to undertake a review of all the problems of communication in contemporary society seen against the background of technological progress and recent developments in international relations with due regard to their complexity and magnitude'.

### Belgrade and Resolution 21/4.19

Four years later, on the occasion of the twenty-first General Conference, held in Belgrade, the Commission presented its report, published under the title *Many Voices, One World*, to the Director-General who, in turn, informed the conference as to its overall conclusions and recommendations.

In its Resolution 4/19 approved on 21 October 1980, the twenty-first General Conference noted 'with satisfaction' M'Bow's Report and, in its Section IV, considered that 'this new world information and communication order could be based, among other considerations, on ...' and enumerated a list of eleven criteria which were the product of a long and difficult negotiating process which took place during the Conference itself.

The twenty-first General Conference also took note of the recommendations of the International Conference for Co-operation on Activities, Needs and Programmes for Communication Development, which had recommended by consensus the 'establishment, within the framework of UNESCO, of an International Programme for the Development of Communication' and approved the creation of the IPDC.

## THE DEBATE ON COMMUNICATION POLICIES

From the start it had been clear that the objectives sought by the various Member States of UNESCO and favoured by a good part of the dominant academic thinking of the time could not be achieved if governments did not formulate clearly defined communication policies that involved not just matters of journalistic practice and principles, but also the necessary thinking about telecommunications and the new communication technologies that were rapidly developing.

A first Intergovernmental Regional Conference on Communication Policies was convened for Latin America and took place in San José, Costa Rica, but only after a major campaign against it had been developed both in North America and abroad by many members of the private media represented in the Inter American Press Association (SIP/IAPA).[12]

These activities, of course, dampened the enthusiasm initially shown by some of the governments in the region and in some ways affected the results and effectiveness not only of the Costa Rica conference but of the subsequent ones, which took place in Cameroon and in Malaysia.

## THE UNITED STATES AND THE UNITED KINGDOM WITHDRAW FROM UNESCO

In 1984–85, and after what can be seen now as part of a concerted strategy in response to the positions adopted by UNESCO over the previous decade in the field of communication, the United States, the United Kingdom and Singapore withdrew from UNESCO membership. This aggravated considerably the existing financial crisis affecting the Organization and led inevitably to important budget cuts and reductions in personnel.

Particularly affected were the sectors concerned with communication, and especially, the Division charged with the study of communication policies and the free flow of information.

As the end of the century approached, the collapse of the Soviet Union and its system, and the exponential transformations in communication technologies, had produced changes that were totally unforeseen only a few years earlier.

While many of the principles and resolutions approved by the Member States of UNESCO during the 1970s and part of the 1980s still had validity, in particularly those relating to the ethical elements of communication, it was also clear that many had been rendered obsolete by a completely new reality. As a result of these changes, and also in response to the Organization's efforts to reform, the United Kingdom rejoined UNESCO in 1997 and the United States returned in October 2003.

At the beginning of the new millennium, the challenge for communication specialists and thinkers, governments and international organizations such as UNESCO was now the daunting task of conceptualizing and contextualizing technologies and communication means that they could barely imagine.

## NOTES

1.    S. Macbride, *Un Sólo Mundo, Voces Multiples: Comunicación e Información en Nuestro Tiempo*, Paris and Mexico City, 1980.
2.    Reuters news agency was based in the United Kingdom and while it was a very independent operation it could not avoid the cultural and political bias provided by its place of origin. In fact, during the world wars, Reuters correspondents sometimes acted as intelligence agents for their country with at least the tacit approval of their managers. Havas, from France, and Wolff, from Germany, were much more openly associated with their governments even if still formally independent.
3.    K. Cooper, *Barriers Down: The Story of the News Agency Epoch*, Port Washington, NY, London, 1969, pp. 7–9.
4.    J. D'Arcy, 'Direct broadcast satellites and the right to communicate', in L. S. Harms et al. (eds.), *Right to Communicate: Collected Papers*, Manoa, HI, 1977, p. 1.
5.    Resolution 633 (VII) of the UN General Assembly of 16 December 1952 states that 'it is essential for a proper development of public opinion in under-developed countries that independent domestic information enterprises should be given facilities and assistance in order that they may be enabled to contribute to the spread of information, to the development of national culture and to international understanding ... the time has arrived ... for the elaboration of a concrete programme and plan of action in this respect' (see K. Nordenstreng, *The Mass Media Declaration of UNESCO*, Norwood, NJ, 1984, p. 4).
6.    J. Gifreu, *El Debate internacional de la comunicación*, Barcelona, 1986.
7.    K. Nordenstreng, op. cit., p. 15.
8.    J. A. Mayobre, *Información, Dependencia y Desarrollo*, Caracas, 1978, p. 187.
9.    K. Nordenstreng, op. cit., p. 15.
10.   See J. T. Alvarez, *Historia y Modelos de la Comunicación en el Siglo XX*, Barcelona, 1987; J. Gifreu, op. cit.; M. Murciano, *Estructura y dinámica de la Comunicación Internacional*, Barcelona, 1992; K. Nordenstreng, op. cit., among others.
11.   K. Nordenstreng, op. cit., pp. 126–27.
12.   J. Gifreu, op. cit., p. 101.

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# 29.2

## THE PRESS AND THE MASS MEDIA

*Rafael Roncagliolo*

As many authors, such as Hobsbawn and Laulan, have pointed out, the nineteenth century was one of the longest ever, but the twentieth century has been one of the shortest. The nineteenth century actually began in 1789 with the French Revolution, ending either around 1914 with the First World War, or in 1918 with the Russian Revolution. The twentieth century, on the other hand, began with the establishment of a new bipolar world order following the First World War and is ending with the disintegration of that very same bipolar system as well as of large ideological movements, wearing down any consensus regarding the great ideals and unproved theories of modernity. The turn of the century has seen an upsurge of new identities, new social movements (women, the environment, and community ventures) as well as new conflicts and civil distress, deeply rooted in ethnic and fundamentalist forces.

From the point of view of the mass media, the twentieth century has been the century of communications and information, par excellence. It started with the consolidation of the popular press – the first cultural industry for the masses – and the expansion of the cinema and radio. It has ended with a new culture – the world of television, the computer, multimedia, and the Internet. Giovanni Sartori refers to the second half of this century as the age of *Homo videns*, while Nicholas Negroponte uses the term *Homo digitalis*.

To illustrate what has occurred with the press and the mass media, the twentieth century could be divided into two parts: the first part (say 1914 to 1945) was the time of the popular press, radio and cinema. The second part (1945–89) was the time of television and the computer, the threshold of the global world of the new millennium. During the first part of this century, Victorian family lifestyles still prevailed, with the family at its centre. During the second half of the century, people began leaning towards a second and complementary lifestyle: individual life.

### 1914–1945: POPULAR PRESS, CINEMA, AND RADIO

Not only did schools develop during the nineteenth century, but also the press. Early in the twentieth century, the two basic components of mass culture and cultural industries were already established: the mass production of messages and advertising as a financial mechanism.

Flichy recalls that a characteristic of the late 1900s was that, for the very first time, industrial production was channelled towards domestic consumers, who until then had been supplied by non-industrial producers. Under these circumstances, newspapers reached hundreds of thousands of readers, piano-making became an industry and the mass consumption of phonographs (Plate 167) and photographic cameras began. Pianos, phonographs, cameras, and telephones (in 1925 one out of every two households in North America had a telephone) became household symbols that were later complemented by the radio, the television, and the computer.

Massive production and consumption are, naturally, based on the growing subordination of cultural industries to advertising. The latter was born in the mid-nineteenth century with the Parisian newspaper *La Presse*, among others. Curiously, the founder of *La Presse*, Emile de Girardin, demanded that the advertisement be 'concise, simple and frank' and that they 'never mask everything'. Nevertheless, throughout the twentieth century, we witnessed the replacement of advertising messages based on information by messages based on seduction. At the end of this process, advertising had been converted into the dominant communication language that moulds other forms of communication.

### POPULAR PRESS

James Gordon Bennett, publisher of *The New York Herald*, stated in 1830 that the press was 'the great organ and pivot of government, society, commerce, finance, religion and all human civilization'.[1] However, the élite press really started turning into the mass media during the early 1830s with the 'penny press,' particularly with the foundation of *The New York Sun* in 1833, which focused on crime and sex and reached a circulation of 10,000 copies a day. *La Presse* and *Le Siecle* appeared in France in 1836, costing 10 cents; in 1863, *Le Petit Journal* was sold at half the price, or 5 cents, reaching a circulation of 350,000 copies in 1869.

The industrialization and increasing volume of expenditure on press advertising at the threshold of the twentieth century gave rise to the very first press barons: Joseph Pulitzer, William Randolph Hearst and E. W. Scripps, who built journalistic empires that turned them into key political agents in the United States. The

power exercised by these barons is illustrated by the story about the dialogue between Hearst and Fredric Remington, his press agent in Cuba early in 1897. Hearst had asked Remington for photographs of the supposed war between the United States and Spain. He received a message from the photographer indicating that there was no war to photograph, to which he replied: 'Please remain. You furnish the pictures and I'll furnish the war'.[2] The truth is that these chains controlled 10 per cent of United States newspapers in 1910 and 40 per cent by 1935.

Over the years, as shown below, both the informative role played by newspapers and their advertising funds were shared first of all with the radio, then television and finally, with the electronic journalism that has recently become completely digital. As a result of this process, by the end of the century declining numbers of people read newspapers and each medium carved out a different niche for itself: people hear news on the radio, confirm it on the television and analyze it in the newspapers.

However, the popular press, radio, and television that characterized communication in the twentieth century were actually invented at the end of the nineteenth century. The war enabled countries to test and develop new inventions in the field of transport (aviation) and communications (radio). During this century, we moved on from mastering the oceans to mastering the air, just as in previous centuries we had moved from the land to the sea during the printing era, according to those who look at human history through the development of media technologies.

## Cinema

The cinema became an extension of nineteenth-century inventions – photography and the phonograph – as a system which in Maxim Gorki's words 'made pictures come alive' and 'which does for the Eye what the phonograph does for the Ear', according to one of its main creators, Thomas Edison.[3]

Although photography dates back to the first pictures taken by Joseph Nicephore-Niepce in 1824, the 1837 daguerreotypes resulting from the cooperation between Niepce and J. M. Daguerre boosted the popularity of the Kodak camera launched by George Eastman in 1898 with the slogan 'You press the button, we do the rest.' The phonograph had also reached mass production and consumer levels as a result of Eldrige Reeves Johnson's introduction of the Victrola in 1906. Sales of these machines reached 96,000 units in 1910. The phonograph began to complement (and sometimes replace) the piano and singsongs at family parties. Later, during the 1920s, the phonograph, the Pianola, and the radio competed for pride of place in the living room. Music became merchandise, thus giving rise to the musical industry.

On 28 December 1895, the brothers Auguste Marie Louis Nicholas and Louis Jean Lumiere invented a machine that was both a camera and a projector. By 1900, they had produced 1,299 short films. During the early 1900s, the pictures began lasting 10 to 15 minutes and westerns and comedies made their appearance. In 1915, D.W. Griffiths presented his three-hour film *The Birth of a Nation*. Even though this film exalted the Ku Klux Klan, it introduced patterns that have become standard in the motion picture industry: close-ups, tracking, cross-cuttings, etc. The first

newsreels were also developed at that time, but were finally overshadowed by television in 1967.

The cinema went through the same industrial concentration process that gave rise to the press barons. In 1909, ten of the greatest producers created the Motion Pictures Patent Company, marking the beginning of Hollywood. Two technical breakthroughs helped to consolidate the popularity of this new art: the first was in 1928, when RCA and Western Electric introduced a sound system that rendered silent motion pictures obsolete. By 1930, the vast majority of the 5,000 films produced were vocal.[4] Seven years later in 1935, the second and decisive breakthrough occurred in the motion picture industry: thanks to a one-million-dollar investment in research and equipment by Technicolor Inc., the first long feature film was produced in full colour: *Becky Sharp*. By then, 40 per cent of the adult population in the United States was going to the cinema at least once a week.[5] The cinema industry had reached its peak (Plate 168).

Attendance at the movies began to decline after the Second World War, even before the expansion of the television industry. Later, television, videotapes, and video games provided a wide range of visual alternatives that negatively affected movie houses. As a result, although more films are shown now than ever before, most of them are not seen in movie houses. Large cinemas that had been built before television made its appearance have now been sub-divided to provide a wider choice of films for fewer spectators. Nowadays, motion pictures are not only shown in movie houses but on the air through television, cable television, pay-per-view, videotapes, and on airlines. Digitalization has contributed greatly to this integration.

## Radio

The press began as a public space with two main goals: to provide information and encourage discussion. Entertainment began playing its role during the nineteenth century, through the popular press. On the other hand, the appearance of radio early in the twentieth century was initially dedicated almost exclusively to entertainment. Jesuit Anchieta made a wireless transmission of the human voice in the Rio de Janeiro Bay in Brazil, before Marconi. Also, a coloured television system was invented in Mexico before the United States systems were patented and marketed. The radio did not appear as the continuation of the newspaper, but as a new domestic appliance for home entertainment purposes, just like the piano and the phonograph before it. 'The radio was to become a household convenience, just like the phonograph, which it would replace for nearly twenty years. Like records, it would provide music to dance to at home'.[6] Consequently, the radio combined the developments of telegraphy and wireless telephony on the one hand, and fulfilled the purpose of the phonograph on the other.

The history of radio and television cannot be mentioned without referring to David Sarnoff, the self-made man who 'one April afternoon received a message about the sinking of the Titanic. He contacted as many ships as he could and informed the press. For seventy-two hours, he was the only link between the shipwrecked people and awestruck America. Was this not, by chance, the anticipated work of a radiophonic reporter?'[7]

The Chief Inspector for the Marconi Wireless Telegraph Company of America, Sarnoff, wrote in a memorandum addressed to his bosses in 1915: 'I have in mind a plan of development which would make radio a household utility in the same sense as the piano or the phonograph … The idea is to bring music into the house by wireless. The receiver could be arranged for several different wavelengths, which should be changeable with the throwing of a single switch or pressing of a single button … The proposition would be especially interesting to farmers and others living in outlying districts removed from cities. By the purchase of a "Radio Music Box", they could enjoy concerts, lectures, music, recitals, etc., which may be going in the nearest city'.[8] The bosses considered this prophetic proposal to be senseless.

Originally, the radio had been an activity for amateurs. By 1922, there were 15,000 transmitters and 250,000 listeners in the United States. These amateurs developed a passion for the radio as a hobby and some of them thought that the radio could become a public service, a passion and concept that persist to this day among amateur radio communities.

After the First World War, the place of those experiences was taken by commercial radio. The first commercial radio station, KDKA, was established in the United States on 2 November 1920 by the Westinghouse firm, which broadcast the results of the presidential elections. Westinghouse had been a major manufacturer of military radios during the war and was seeking a new civilian market for its appliances. Consequently, the radio had two origins that differed considerably from that of the press: (a) it was created for entertainment rather than for broadcasting news, and (b) it appeared with the intention of selling receivers (the hardware preceded the software).

There were 30 radio stations in the United States by 1922 and 500 by 1923. In 1922, 100,000 radio receivers were sold at an average cost of US$50 each. In 1929, more than 4 million receivers had been sold at an average price of US$100 (equivalent to four weeks of average wages). According to the 1930 census, more than half of American households owned a radio and 80 per cent of them listened to it every day.

Radio soon conquered other areas. One of these was the special purpose radio, e.g. police radios. Car radios were another radio development niche. In 1931, only 1 per cent of cars were equipped with a receiver, which is equivalent to 100,000 car radios, less than 3 per cent of all the radio receivers sold that year. However, 700,000 car radios were sold in 1934 and 7.5 million in 1940, which meant that 25 per cent of the cars were equipped with radio receivers. This percentage rose to 75 per cent during the 1960s.

Also unlike the press, which operated in the market with absolute freedom, commercial radios had to transmit through frequencies granted by the government under the obligation to broadcast clean programs 'in the public interest, convenience and necessity' (Communication Act 1934.[9]

The creation of this new means of communication posed a crucial question that prompted lively debates, even in the United States: Who should pay for radio? The recipient, the transmitter, the advertiser or the state? The market and business interests that could not do without this powerful new instrument gave the reply. The first radio advertising spot appeared in 1924. In 1935, more than US$100 million was spent on radio advertising.

Companies producing on a national scale also required nation-wide publicity, hence the emergence of networks, the first of which was the National Broadcasting Company, which made its appearance on 15 November 1926 with 24 stations and an audience of 12 million people. Obviously, the networks required even more advertising as the only means of financing the cost of maintaining the telephone lines that became so essential.

The evolution of invoicing gives an idea of the importance that radio acquired as an advertising instrument in the United States: US$4 million in 1927, US$50 million in 1936, and US$300 million in 1945. The year 1936 is significant in the history of communications, because of three events: the first electoral campaign by radio, the first public opinion polls (Gallup) and the birth of the behaviourist tradition of mass communication research. Paul Lazarsfeld, radio's first social researcher and creator of mass communications research, stated in 1940 that 'Broadcasting in America is done to sell merchandise, and most of the other possible effects of radio become submerged in a strange kind of social mechanism, which brings the commercial effect to its stronger expression'.[10]

Although we are referring to the commercial radio developed in the United States, originally there were three models. The American commercial model governed by economic yield; the European public service model governed by the socio-cultural yield (developed by Giuseppe Richeri), and the government-party political yield model inaugurated by the Radio of the People's Counsel of Commissioners of the Russian Revolution.

The radio continued growing during the post-war period, particularly because of the lower prices and better quality of frequency modulation (FM) and transistor radios. FM began in 1936 with the allocation of a small number of frequencies for experimental purposes, increasing to 600 stations during the post-war period and continuing to grow during the 1960s, boosted by rock and roll and local stations, until 75 per cent of the United States audience was covered during the 1990s. The transistor was invented in Bell Laboratories (1947), giving rise to the appearance of transistor radios in 1954.

After the Second World War, radio preferences were already being shared with the television. 'People tended to listen … not in family groups … The television set had taken over the living room, while the radio had moved into the bedroom, or the car, or even the pocketbook'.[11]

By the end of the century, the radio and all other media have became part of transnational multimedia corporations and have joined the digital world, through Digital Audio Broadcasting.

## 1945–1989: TELEVISION

The existence of television has been imagined ever since the telephone was invented: if the voice could be transmitted through air, why not pictures? As far back as 1879, *Punch* magazine's draftsman George du Maurier had already imagined a couple sitting in their living room following a badminton match on the screen.

The first television system was developed in 1926 by John Logie Baird in the United Kingdom, using a Nipkow disk, a photoelectric cell, and hollow tubes to amplify the signal and a neon light bulb as a receiver. The British Broadcasting Corporation used this primitive system with

only 30 horizontal definition lines, from 1929 until 1937, when the electronic solution was incorporated. France also started broadcasting on 26 April 1935, using a mechanical procedure (180 lines) invented by René Barthelemy, which remained in use until 1938.[12]

At the same time, television was developed in the United States based on cathodic ray tubes (CRT) and the work of Philo T. Farnsworth and Vladimir Zworykin. In 1930, Zworykin left Westinghouse, which had shown little interest in his work with the 'iconoscope,' to join RCA, the main manufacturer of radio receivers, which was then chaired by David Sarnoff, who had written the following in 1923: 'I believe that television … will come to pass in due course … It may be that every broadcast receiver for home use in the future will also be equipped with a television adjunct by which the instrument will make it possible for those at home to see as well as hear what is going on at the broadcast stations'.[13]

RCA began broadcasting experimental television programs in 1935 and made a presentation in New York during the 1939 World Fair, including President Roosevelt's inaugural speech. Television already existed in several countries and the Second World War only temporarily interrupted its spectacular development during the post-war period.

In 1946, only 8,000 homes owned a television in the United States. This number rose to one million in 1949, more than 10 million in 1951 and 45 million in 1960, by which time almost 90 per cent of all American homes had a television set. Naturally, this growth rate continued after 1964, when colour transmissions were fairly generalized.

The same structure and finance guidelines that each country had adopted for radio were followed for television: private TV in the United States (and later in Latin America); public TV in Europe and the rest of the world. This primarily affected radio, given that since 1945 television began absorbing most of the expenditure on advertising as well as previous radio broadcastings of the most important soap operas. The cinema industry was also affected as fewer people attended movie houses; therefore it immediately tried to form a partnership with the television industry, producing TV shows and selling its old films to TV stations.

Colour television made its appearance during the 1950s. There were three image definition standards: NTSC, PAL, and SECAM. The latter two had a larger number of lines and, therefore, a better quality image. Most countries chose European standards (PAL and SECAM), except the majority of Latin American countries and some Asian ones that adopted the American-Japanese standard, NTSC. Consequently, state decisions concerning technological breakthroughs have followed economic and cultural dependence, encouraging some international exchange of cultural products and preventing others. In other words, subordination and isolation were created simultaneously.

By the end of the 1960s, the television market in developed countries appeared to be saturated. However, the demand multiplied during the new decade as a result of a new surge of audio-visual inventions: cable TV, satellite TV and the video recorder (VCR). Cable was in fact an old technology that had been used back in 1948 in remote areas where costly antennae were required in order to receive signals. It was therefore better to invest in a single antenna in each place and distribute the signal to households via cable. Hence the creation of CATV: Community Access Television.

Based on CATV, pay-per-view television made its appearance in 1972. Taking advantage of communication satellites in operation, the first of which was launched in 1964, cable became a business that provided a better signal and created a much higher demand, which will reach its prime once all coaxial cables are replaced by optic fiber. Thus, in the early 1990s, more than 60 million households in the United States were connected to cable and there were more than 1,000 cable television companies. In 1997, two out of every three homes had cable television in Argentina. Thanks to price cuts in this sector of the economy, television stations are sprouting all over the world, consisting of no more than a satellite receiving antenna, a video recorder and, sometimes, a camera.

It was John Logie Baird himself who began video recording in 1926, using 78 r.p.m. records. Since then, numerous attempts were made to produce audio-visual recording devices for commercial purposes, including the first Ampex recorder introduced in 1957 at a cost of US$45,000 per unit. As a result of various commercial experiments, the videotape triumphed over the video-record, making it possible to reduce the size and cost of the units. In 1975, Sony introduced the Beta system, and in 1976, JVC/Matsushita introduced the VHS system, which would become the predominating standard after a few years. By 1978, 400,000 households in the United States already owned VCRs. In 1983, 4.1 million VCR units were sold in that country and this figure almost doubled the following year, reaching nearly 8 million. In 1985, 20 per cent of the homes in the United States were equipped with video recorders. UNESCO provided the estimates in Table 20 for the 10 countries with the highest percentage of homes owning VCRs in 1989.

At the same time, the worldwide expansion of VCR sales and the development of video-rental establishments occurred. Videotapes also contributed greatly to audio-visual globalization (Plate 169) and the evasion of government censures on television. It is estimated that there were 300,000 VCRs in the Soviet Union in 1986.

Breakthroughs continue multiplying. The early 1990s also marked the appearance of the camcorder, a device that combined a television camera with a video recorder, giving rise to the production of home videos. Video games are

*Table 20* **Percentage of households owning VCRs in selected countries**

| Country | Percentage of households owning VCRs |
|---|---|
| Japan | 70 |
| Lebanon | 65 |
| Hong Kong | 64 |
| Bahrain | 64 |
| Australia | 63 |
| United Kingdom | 60 |
| United States | 59 |
| Canada | 58 |
| Bermuda | 55 |
| Saudi Arabia | 52 |

*Source:* UNESCO, 1989, *World Communication Report*, pp. 159–60.

another milestone of the entertainment industry and the use of the television monitor, although these are now fully integrated with the computer.

As far as television is concerned, the century is ending with High Definition Television (HDTV) projects. As occurred when the colour television system was adopted, discussions have focused on differences between the Japanese standard and the European standard. Clearly, television will also become fully incorporated into the digital era; the main concern is whether there will be enough space for all the voices and images when the new digital frequencies are allocated at the end of the century, not only for the commercial ones but also for community broadcasts that offer an alternate view to complement global views.

Undoubtedly, television is the major communication phenomenon of the twentieth century. It has changed the cultural landscape, encouraging linguistic unification (such as the use of the Italian language in Italy) and given shape to the 'global village' that Canadian communications theorist Marshall McLuhan spoke about. There are many controversies regarding its effects. Giovanni Sartori, one of the political scientists who has spent time analyzing trends in contemporary democracies, is particularly critical of the historical rupture implied by television. He says television 'primarily and fundamentally changes the very nature of communication, transporting the context of the word (printed or through radio broadcasts) to the context of the image .... By the same token, it is clear that television cannot be treated as a mere extension of the communication instruments that preceded it'.[14] According to this political analyst, 'television produces images and undermines concepts, thus causing us to reduce our concentration powers and our ability to understand ... *Homo sapiens* is thus replaced by *Homo videns*. In the latter case, the conceptual language (abstract) is replaced by the perceptive language (concrete), which is infinitely poorer, not only in terms of the number of words, but particularly in terms of the richness of meaning, i.e. the ability to see between the lines (connotative skills)'.

Television appears to have a particularly profound effect on children's education as well as on political democracies. 'Television is a child's first school (the fun school that precedes the boring school)'.[15] At the same time, video-politics have emerged, either overshadowing or replacing the party politics that characterized contemporary democracies until the 1980s. Many philosophers (particularly Pierre Bourdieu and Sartori himself) have expressed their concern about this dimension of television.

In fact, since the first televised electoral campaign – the American elections of 1952 when General Dwight Eisenhower ran against Adlai Stevenson – television has been playing an ever-increasing part in politics. 'In 1980, three-fifths of those surveyed said that TV played a significant part in their deciding whom to vote for in that year's elections, compared to only about two-fifths in 1970'.[16]

The nature of the television language forces people to focus on candidates rather than on programs, on pictures rather than on speeches, on pathos rather than on logos, on seduction rather than on conviction. It is not necessary to form party teams to act as mediators between the candidates and their support base, but to establish good public relations with the media, particularly with television, in order to obtain a decisive political advantage, often without any accountability or social control whatsoever.

## THE THRESHOLD OF THE NEW MILLENNIUM: THE GLOBAL WORLD

The cultural panorama at the end of the twentieth century is a complete novelty. In 1989, there were 600 million television sets in the world. In the United States, 99 per cent of households owned at least one television set and every home had an average of 5 radios (not including car radios) and a personal computer. Naturally, the new means of communication displaced the old. The panorama recorded by UNESCO in 1992 can be seen in Table 21.

Based on the same UNESCO *Yearbook*, the following percentage variations in the consumption of each medium between 1970 and 1990 were estimated: newspapers: 1 per cent; books: 15 per cent; cinema seats: 20 per cent; radio receivers: 116 per cent; television sets: 93 per cent.[17] Such is the new cultural galaxy, which marks the decline of reading (newspapers and books) and mass spectacles (cinema) and the affirmation of electronic media (radio and television).

Amusement and information have become global phenomena. Football has turned into the favourite spectacle on a worldwide scale. Television broadcasts of wars have become a routine in our times, from the Vietnam war,

*Table 21* **Media consumption by region**

| Region | Newspapers* | Books** | Cinema Seats* | Radio Receivers* | TV Sets* |
|---|---|---|---|---|---|
| EUROPE | 332 | 565 | 58 | 699 | 375 |
| NORTH AMERICA | 248 | 392 | 40 | 2017 | 798 |
| OCEANIA | 206 | 454 | 20 | 944 | 375 |
| LATIN AMERICA and the CARIBBEAN | 94 | 96 | 17 | 342 | 164 |
| ASIA | 64 | 74 | 7 | 182 | 64 |
| ARAB STATES | 39 | 29 | 4 | 252 | 102 |
| SUB-SAHARAN AFRICA | 17 | 21 | 3.1 | 148 | 22 |
| WORLDWIDE Average | 111 | 159 | 20 | 342 | 156 |

* Per thousand inhabitants        ** Per million inhabitants

*Source:* Adapted from UNESCO, 1992, *Statistical Yearbook 1992.*

which inspired McLuhan's 'global village', which to the Gulf war announced Baudrillard's 'post-modernity.'

Globalization is becoming increasingly digital. The group of cultural assets comprised by the press, radio and television can now be stored and transported in bits and bytes, through satellites and optic fibers. Consequently, the decision regarding the type of means of communication to be used (press, radio, or TV) can be transported from the transmissions point to the receiving point.

Furthermore, thanks to the Internet, the personal computer, which emerged as a data processing machine, has become a means of communication capable of replacing mail, telephone, and fax and introducing the new videophone experience.

It is the concentration of economic resources that supports globalization. Corporations like Time-Warner, Murdoch, Maxwell, Berlusconi or Havas control an ever greater part of the new multimedia complexes. With the expansion arrives a third type of censorship, commercial censorship, which has come to inherit the old ecclesiastical and state censorship.

The twentieth century is, par excellence, the century of the press and mass media. Consequently, it is also a century in which thoughts have been focused on information and communications, and most of the theories regarding cultural industries and the culture of the masses were conceived in its early decades. The second part of the century gave rise to the consensus that we are going through a revolution of information and communications, expressed in a variety of terms: new information and communication technologies, the third industrial revolution, global village, information highways, telematics, communications, information society, videosphere, post-Fordism, Gatesism, and so on.

Throughout this century, we have witnessed the weakening of public spaces and, at the same time, partial and selective attempts to gain democratic access to knowledge and culture. Cultural industries, whose social effects so fascinated the Frankfurt school from the 1920s onwards, have now become transformed. They moved from being industries of the written word to industries of the image; from comprising a closed list of different products to an endless number of intertwined goods and processes; from transportable objects (books, newspapers, records), to purely communicative messages; from producing for education and leisure time to meeting the demands of daily lifestyles and economic activities. In short, they have become the hubs of the economy and society.

## NOTES

1.   S. Lubar, 'InfoCulture', *The Smithsonian Book of Information Age Inventions*, Boston, MA, 1993, p. 19.
2.   Ibid., p. 29.
3.   Ibid., p. 199.
4.   Ibid., p. 205.
5.   Ibid., p. 207.
6.   P. Flichy, *Une histoire de la communication moderne: Espace public et vie privée*, Paris, 1991, p. 150.
7.   Ibid., p. 145.
8.   S. Lubar, op. cit., p. 213.
9.   Ibid., p. 220.
10.   Ibid., p. 227.
11.   Ibid., p. 232.
12.   P. Flichy, op. cit., p. 191.
13.   S. Lubar, op. cit., p. 247.

14.   G. Sartori, *Homo videns: la sociedad teledirigida*, Madrid, 1997, p. 35–36.
15.   Ibid., p. 37.
16.   S. Lubar, op. cit., p. 255.
17.   R. Roncagliolo, 'Libertad de expresión y desafío tecnológico', Paper submitted to the Seminar on 'Desarrollo de los Medios de Comunicación y la Democracia en América Latina y el Caribe', UNESCO-PNUD, Santiago de Chile, 2–6 May 1994.

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# 29.3.1
## THE WORLD'S ARCHIVES

*Michel Duchein*

### THE SITUATION OF THE WORLD'S ARCHIVES IN 1914

In 1914, at the outbreak of the First World War, almost all European and American countries had their own national archives, some dating as far back as the eighteenth century, but most to the nineteenth. Legislation and regulations concerning public archives had begun to develop, at least in the countries whose administrations were most advanced. However, many shortcomings still needed to be addressed, particularly in terms of the physical conditions in which archives were stored (few buildings were really suitable) and access for researchers. In many countries, even those with a strong archival tradition, consultation of documents remained subject to very long delays and special permission: this was the case in Austria, Prussia and Russia, for example, not to mention Turkey.

Outside Europe and America, only a few European colonies had organized archives, which were modelled on those in the colonizing country. Here in particular, the physical conditions in which archives were kept were generally deplorable, made worse by the tropical climate.

However, changes were already noticeable. The main principles of archive management, i.e. storage for the archives, the principles of provenance and structure and the *metodo storico* of Italian archivists, were well known and more or less universally accepted (in theory, at least). The manual on archive management compiled by Dutch archivists Muller, Feith and Fruin and published in 1898 had been translated into German, English, French and Italian. An inaugural international congress held in Brussels in 1910 had laid the foundations, if not for an international archive organization, at least for regular collaboration between archivists from numerous, mostly European, countries.

In particular, pressure from historians was beginning to open the way for archives to be made accessible for research and, in several countries, archives were no longer considered the exclusive domain of ancient documents; new items were being added regularly, something that had seldom happened in the nineteenth century.

### THE 1914–1918 WAR AND ITS CONSEQUENCES FOR ARCHIVES

Many archives were destroyed during the 1914–1918 war, particularly in Belgium and northern France. Other, less well-known, archives were destroyed in the former Ottoman Empire and Eastern Europe. In particular, however, the great political upheavals in Europe led to huge quantities of archives being transferred between the former empires and the new countries that replaced them.

The victors and historians were particularly interested in the archives of Austria-Hungary. They were transferred in accordance with the treaties of Saint-Germain-en-Laye, Trianon and Sèvres (1919–20), following the principle that collections should be kept together, although in some cases their distribution on the basis of 'territorial relevance' resulted in the new countries taking possession of documents originally owned by former administrations located in other countries. Certain disputes over these documents remain unresolved even today.

National archives were immediately created in all the countries established under the 1919 and 1920 treaties, with laws passed to establish their legal status and conditions of access; in the 1930s more than ever, archives were considered a national symbol and an attribute of sovereignty.

1 June 1918 is a landmark date, the day Lenin signed the famous decree which was to govern the organization of the archives of the future Soviet Union until 1991. The principle, which was revolutionary in all senses of the term, was that all the country's archives should constitute a 'single collection', owned by the people. On the basis of this principle, the archives were highly centralized and regulated in great detail. This decree, which was inspired by the French law of 1794, stated that all documents from the 'single collection' were freely accessible; however, under the dictatorship of Stalin and his successors, such openness proved to be a complete illusion, since the Soviet archives remained among the world's most inaccessible until the break-up of the USSR.

### THE INTERWAR YEARS

As far as archives are concerned, the twenty years that elapsed between the two world wars were particularly marked by a growing awareness of the needs of the administration and of modern historians. Nineteenth-century archivists were primarily interested in ancient archives; they failed to see the need to add to the collections or to sort and classify more recent documents. It was during the 1930s that, in most countries, these questions were addressed by theoretical studies and practical applications for the very first time. In particular, the frequency with

which recent documents were archived was regulated virtually everywhere and rules were drawn up concerning the sorting of the documents to be kept. The creation of the United States National Archives in 1934 is characteristic of this new-found awareness.

As a result of these developments, several archive management manuals were published, some of which are still considered classics today (e.g. Sir Hilary Jenkinson, 1922, Eugenio Casanova, 1928). Several countries drafted laws establishing the legal status of public archives, which previously had not always been clearly defined.

Historical research also changed radically in the years leading up to the Second World War. Partly under the influence of the Marxist school, more and more emphasis was placed on the study of economic and social structures, which meant consulting types of document that had rarely been used up to that point: accounts, fiscal archives and documents drawn up by notaries, as well as bank, industrial and commercial archives. Not without difficulty archivists were forced to adapt their methods in order to meet these new demands; ancient archives were no longer the only ones in demand, and this phenomenon gathered momentum after the war.

## THE SECOND WORLD WAR

First and foremost, the Second World War was a period when many archives were destroyed, not only in Europe – Poland, Belgium, the Netherlands, France, Italy, Germany, the Balkans, USSR – but also in Asia and the Pacific (Plate 170). The loss of the archives of the Kingdom of Naples, in 1942, deprived the southern half of Italy of its historical heritage dating back to the Middle Ages (while, in a sort of prologue to the Second World War, many Spanish archives were destroyed during the 1936–1939 civil war).

However, quite apart from these losses, the 1939–1945 war had very long-term consequences for the future of the world's archives. In particular, the war generated masses of documents of all different kinds, produced by various bodies – military, economic and political – in all the warring countries and those that were occupied. The global nature of the war, which involved increasingly complex technologies, led to previously unimaginable increases in documentary production; management of the documents created problems completely disproportionate to any that had ever been experienced before.

Even before the war was over, two countries took the initiative of studying the problem systematically: the Grigg Committee in Great Britain and the Hoover Commission in the United States evaluated all the relevant war archives. They reached identical conclusions: in order to deal with these documents, special institutions had to be created to act as intermediaries between the bodies that produced them and the archive departments themselves. These institutions, known as 'records centers', 'intermediate repositories' or 'dépôts de pré-archivage', which were set up in many countries from the 1950s onwards, now form the basis of the most advanced modern archiving systems.

In 1964, the American archivist Schellenberg deduced from the Grigg and Hoover reports the theory that archives could be divided into 'three ages' (current, intermediate and final or historical archives). This system was universally adopted and is now one of the basic principles of world archive management.

## ARCHIVES ACROSS THE WORLD

One of the basic historical phenomena of the second half of the twentieth century was decolonization, during which numerous states emerged from previous colonial empires. With a very small number of exceptions, these new states have all created their own national archives and archive laws. Nowadays, archives enjoy legal status in every country of the world, although that does not mean they are well organized in every case.

Dividing the archives between the newly independent countries and the old colonial powers was no easy task. Different systems were used, depending on how the archives had been organized before independence and on pre-existing colonial structures. As a rule (although there are exceptions), archives that were created in the countries themselves by colonial administrations stayed put, while those set up by the governments of the colonial powers were kept in the former home territories. In some cases, particularly Algeria, which was not legally a colony but part of metropolitan France, the distribution of archives was a source of conflict, although it was usually resolved amicably following independence. A round table was organized in Cagliari (Sardinia) in 1977 to discuss these issues and draw up principles, which are now more or less universally accepted.

After the previous abortive efforts in Brussels in 1910, the founding of UNESCO in 1946 enabled archivists from all countries to form a common organization, the International Council on Archives (ICA/CIA), a non-governmental organization (NGO) established in 1948 and based in Paris. The ICA/CIA holds an international congress every four years (the last two were in Beijing in 1996 and Seville in 2000) and an international round table every year (CITRA: the last was held in Budapest in 1999), the proceedings of which are published. It also produces two multilingual reviews – *Archivum* since 1951 and *Janus* since 1985 – as well as manuals and *Studies*. Its various technical committees cover all issues connected with modern archiving. It currently has approximately 1,300 members (archive institutions, archivists' associations and individuals) from more than 160 different countries.

Another international archiving initiative is the series of *RAMP Studies*, which have been published since 1977 by UNESCO and the ICA/CIA. A further global publication is the large collection of *Guides to the Sources for the History of Nations*, which cover all five continents and which have been published by the ICA/CIA since 1970.

The fact that virtually every country in the world has national archives and archive laws does not, however, mean that archive management and accessibility are the same everywhere: far from it! The way in which archives are organized is closely linked to the particular country's governmental, administrative and legal system. For example, archives tend to be decentralized in federal states but centralized in unitary states. The influence that national archives have over regional and local archives varies from country to country. Similarly, the extent to which rules on the management of current and intermediate archives are binding depends on the country concerned.

It would therefore be illusory to think that archives could be managed in the same way throughout the world. As a legacy of the past and a reflection of the present, archives have their own personality. However, it is at least possible to try to standardize certain methods: classification,

description and communication to researchers, for example. The ICA/CIA is working towards this goal; the ISAD General International Standard on Archival Documents for archival description, which has been adopted by numerous countries since 1993, is a promising first step.

## NEW TECHNOLOGIES AND ARCHIVES

Since the end of the Second World War, the threat to archives posed by technological advances has been increasing year by year, to the point where their future is now in serious doubt.

Until around 1960, all archives produced and stored in the world were composed of paper documents (or, in rare cases, parchment). Suitable precautions were taken to ensure they were preserved and used correctly. These days, however, more and more documents are being created on new media (film, magnetic tape, electronic media, laser discs) and can be stored and accessed only by using machines (machine readable records) that evolve extremely quickly; and as a result, the documents themselves are in danger either of disappearing in the short or longer term because of the fragility of the medium on which they are stored or, more probably, of becoming unusable when the machines required to read them become defunct.

Today, most archive documents can still be consulted in paper form, although this is becoming increasingly rare for many technical, financial, demographic and other documents, which now exist only in electronic form. These issues are currently being discussed at international level (congresses, round tables, symposia, etc.) and have by no means all been resolved; in fact, they are a growing source of concern as technological progress accelerates. Nobody can predict with any certainty what archives will consist of a century or even half a century from now.

On the positive side, modern technologies (particularly digitization) at least make it easier to preserve and use traditional archives, which is definitely a step in the right direction. Technical advances in the construction and equipment of archive buildings, which have grown in number over the last fifty years, also contrast greatly with the previous half-century.

## VOCATIONAL TRAINING OF ARCHIVISTS

For a long time, until the mid-twentieth century, the distinction between the professions of archivist and librarian was very blurred in many new countries; in too many cases, vocational training therefore tended to focus more on library management than on that of archives.

Moreover, in countries with strong archival traditions, such as Germany, Spain, France, the United Kingdom and Italy, vocational training for archivists was almost always based on historical sciences, palaeography, diplomacy, history of law, with little attention paid to modern archives.

Since the 1950s, however, there have been two main developments that have challenged this tradition: the professionalization of archivists, with archive management now generally considered a science *sui generis*, and the

modernization of their training. Depending on the country, archive management may be taught in universities, in archival institutions themselves, or in specialized schools. In many countries, archivists' associations play a vital role in the way this training is organized and in the drafting and dissemination of professional standards.

Unfortunately, not all countries currently provide high-level training in archive management. The ICA/CIA does try to coordinate training at the international level, but there is no escaping the fact that, in many developing countries, the lack of competent archivists is a serious handicap for the future of archives.

## ARCHIVES FOR CITIZENS

Until after the Second World War, archives functioned almost exclusively as the memory of administrative bodies and a source for historical research. In principle, they were accessible to all citizens, but in reality they were only ever consulted by historians, and, in every country, documents were made accessible only after fairly long waiting periods (50, 60 or even 100 years).

A real psychological revolution took place from the 1960s onwards, linked to the affirmation of the democratic right to information and to the growing public interest in contemporary history. An international congress of archivists, held in Washington in 1966, stressed the need for greater openness. In 1966, the United States Freedom of Information Act, by proclaiming the principle of free access for citizens to administrative documents (which was subsequently imitated by most democratic countries), opened up a new era in the history of archives, which ceased to be the exclusive domain of historians and other academic researchers.

Nevertheless, in order to protect people's privacy and states' legitimate interests (public security, etc.), some categories of document may still be consulted only after a certain period of time, in most countries 20 or even 30 years, apart from a few exceptions stipulated in national laws.

## FUTURE PROSPECTS

The legal status of archives is recognized virtually everywhere, whether they are public archives (owned by states and public authorities) or private collections (owned by individuals, companies and private-law bodies). However, much remains to be done, particularly in countries with no archival tradition, to ensure that the institutions actually abide by the principles enshrined in the law.

In particular, a significant effort is needed to construct and renovate suitable buildings in order to create a proper environment for the preservation and public consultation of documents.

Vocational training for archivists should also be more widely available and geared to the historical, administrative, legal and climatic contexts of the different regions of the world.

In particular, the accelerating emergence of documents stored on new media, which can be accessed only by using machines that are constantly evolving, poses problems which may radically transform the nature of archives in the next half-century.

The fate of the whole historical memory of nations, peoples and all of humanity depends on the answers that are found to these difficult questions.

## BIBLIOGRAPHY

No single publication covers all that is dealt with in this chapter. However, most countries have their own manuals or archival reviews which detail the development of archives since 1914.

General bibliographies can be found in the publications of the International Council on Archives (ICA/CIA, 60 rue des Francs-Bourgeois, 75942 Paris Cedex 03), particularly the *Archivum* and *Janus* periodicals and the series of International Conferences of the Round Table on Archives (CITRA), held since 1954.

Volume XLIV of *Archivum* (1999), entitled *Basic Archival Problems: Strategies for Development*, contains a complete bibliography of the *RAMP Studies*, a list of archival reviews throughout the world and archival bibliographical resources on the Internet.

All legislative texts concerning archives throughout the world until 1994 were published in 8 volumes of *Archivum* (Vols. 11, 17, 19, 20, 21, 28, 40 and 41).

Finally, a recent publication containing 22 essential studies (in English and French) on archival culture, the international organization of archives and the legal principles for the international transfer of archives was written by the former Secretary General of ICA/CIA, Charles Kecskemeti: *Sovereignty, Disputed Claims, Professional Culture: Essays on Archival Policies* (Brussels, Archives et Bibliothèques de Belgique, 4 boulevard de l'Empereur, B-1000 Brussels).

# 29.3.2

## LIBRARY DEVELOPMENT

*Pamela Spence Richards*

### NINETEENTH-CENTURY LEGACIES

By the end of the First World War, three major trends had emerged to influence the development of modern libraries: The French tradition, originating in the seventeenth century of princely libraries that collected cultural treasures for a prescribed elite; the German academic research library tradition arising from the needs of eighteenth-century enlightenment scholarship; and the Anglo-American tradition of tax-supported free public libraries, greatly stimulated at the beginning of the century by the philanthropy of Andrew Carnegie (1835–1919). Each of these traditions had influences outside the areas of their immediate origins: The French influence was strong in Spain and Latin America; German academic libraries set the standards not only for Eastern Europe but for American academic library development; and the Anglo-American free public library was widely copied in Scandinavia as well as influencing public library development in Northern and Western Europe. The nineteenth century had also seen the founding and blossoming in Europe and the Americas of national libraries as symbols of national cultural identity and as important vehicles in the reproduction of culture. A number of these national libraries participated in international exchanges of government and scientific publications. A parallel development was the founding of national associations of professional librarians (the first being the American Library Association in 1876) and the establishment of book classification and cataloguing standards (such as Melville Dewey's 1876 Decimal Classification and the 1908 Anglo-American Cataloguing Code in the English-speaking world, the 1899 Prussian Instructions in Germany, and the Universal Decimal Classification System published between 1904 and 1907 by the Belgian Paul Otlet). Over a century after its creation, the Dewey Decimal Classification had become the most widely disseminated classification scheme in the world, used in more than 130 countries and translated into some thirty languages. By 1918 specific national norms of librarianship had been extended through the colonial systems of the British, French and Spanish empires, leaving imprints, which still endure. Professional norms of standardization in cataloguing and classification – especially through decimal classification systems – had in the first decades of this century spread to all the industrializing countries, including Japan.

### THE 1920s

The economic consequences of the First World War enormously retarded the rebuilding of international scholarly and scientific networks such as publishing and interlibrary exchanges, as did a sustained international boycott against German science and scholarship that prevailed until Germany joined the League of Nations in 1926. The important contribution of science to weaponry during the First World War awakened government interest in scientific library development in Great Britain, Germany and the new Soviet Union, each of which established government-supported agencies for the acquisition and distribution of foreign scientific publications to their research libraries: in Great Britain the Department of Scientific and Industrial Research (1916), in Germany the *Notgemeinschaft der deutschen Wissenschaft* (1920) and in the Soviet Union the Office of Foreign Science and Technology (1920). Germany's economic crisis compelled its research libraries to develop a national cooperative acquisitions programme, run by the *Notgemeinschaft*, as well as an efficient national interlibrary loan system (1924). The introduction of standardized cataloguing in a number of countries permitted the planning of national union catalogues listing the combined holdings of the nation's research libraries. One such national union catalogue began at the Library of Congress as a card catalogue in the 1930s. The first published national union catalogue was that of Germany, which brought out 14 volumes before 1939. With these national union catalogues, and with the appearance of annual commercial publishers' lists in a number of countries, the achievement of national bibliographic control – a record of the nation's published production as well as of its library holdings – came closer to realization.

The Russian Revolution of 1917 breathed new energy into many philosophical issues surrounding public librarianship. Millions of volumes confiscated from the old Tsarist aristocracy and its institutions were made available to Russian readers for the first time. The Soviet leadership developed a distinctive new style of library professionalism, differing radically from previous models. In the Anglo-American sphere, the task of the tax-supported library as it developed in the late nineteenth century was to respond to the reading desires of the local community supporting the library. The Soviets, faced with a largely illiterate population,

which the central government hoped to politicize through reading, developed the concept of 'partisan librarianship'. After intensive work in literacy training for the masses, the 'partisan librarian' used the library to raise the 'socialist consciousness' of the citizens through carefully selected readings. The 'objective' approach of Western librarianship was denounced as a fraudulent method of disguising a bourgeois ideological agenda. The Soviets recognized the central role of the public library in public opinion formation and encouraged librarians to participate actively in the struggle for socialism. As part of this new approach, the Soviets, with the encouragement and support of Lenin's wife Nadezhda Krupskaia, introduced many innovations in public librarianship, including the widespread establishment of factory and trade-union libraries and the general use of public libraries as centres for adult education in foreign languages, technology and general culture. Library collection development was overseen by a central Soviet cultural agency to ensure the exclusion of literature which might work against the regime's Marxist policies, which included the official policy of 'scientific atheism'. From the late 1920s libraries and librarianship were important cogs in the centrally controlled ideological machinery of the Soviet state, which partially explains the extraordinary dynamism of Soviet literacy training and library development before the Second World War.

But in North America library development after the First World War proceeded with little assistance from the central government except for the continued maintenance of a medical library for the US Army and of a national agricultural library. The traditional pattern of private and local financial support for academic and public libraries led to enormous variation and inequities in library service and permitted the exclusion of Americans of African descent from most library facilities in the southern states. The most important stimulant for library development both nationally and internationally at this time were the Carnegie and Rockefeller foundations. The Carnegie Corporation, founded by steel magnate Andrew Carnegie in 1911, had built over 2,000 public and academic libraries in the English-speaking world before 1917 but concentrated after the Second World War on library education, including the subsidizing of foreign students' education at American library schools. The Rockefeller Foundation, founded in 1913 by the oil baron John D. Rockefeller, concentrated primarily on the sciences and assisted in the reconstruction and rehabilitation of a number of scientific research libraries in Europe after 1918, including several in Germany. Finally, the founding in London in 1927 of the International Federation of Library Associations (IFLA) under the aegis of the League of Nations marked the formal rededication of the library profession to international cooperation that had been suspended at the outbreak of war in 1914.

## THE 1930s

The worldwide economic crisis, which began in 1929, heightened interest in techniques of photographic reproduction, which could lessen the costs of the acquisition, storage and dissemination of library materials. After the invention of microfilm in 1929, this technology dominated the imagination of library planners for two decades. Research libraries serving scientists whose main reading matter was current journals rather than books focused on the possibilities of microfilm for interlibrary loans and for achieving total bibliographic control of scientific subject areas. A branch of librarianship calling itself 'documentation' – focusing on documents rather than on books – assumed leadership in the development of photographic techniques for storage and dissemination. The International Federation of Documentation (FID), founded in 1895 by the Belgian Paul Otlet (1868–1944), became the locus of these developments and in 1937 staged a conference in Paris at which the newest technologies of photo reproduction were exhibited. At the conference the writer H. G. Wells told the assembled documentalists that their work with microfilm made it possible to realize his concept of the 'world brain', in which the complete records of civilization would be stored for easy access by all mankind.

The assumption of power by the National Socialists in Germany had a dramatic impact on library development both in Europe and elsewhere. A law of 1933 firing all Jews and socialists from German civil service positions created a diaspora of German librarians which would influence library development in other countries, particularly Turkey, whose leader Mustafa Kemal invited German scholar refugees to help him build a modern secular educational infrastructure, including modern libraries – the great medieval tradition of libraries in the Arab world having been stifled by the Ottomans' banning of printing until 1729. The National Socialists, who saw the Germans as 'culture bearers' to the rest of the world, attached much importance to their own public and research libraries as symbols and servants of 'Aryan' culture. Because they recognized the role of libraries in strengthening and reproducing culture, they were particularly destructive of libraries in those countries under their occupation whose cultures they held in contempt.

## THE 1940s

The first five years of this decade were some of the blackest in the history of libraries, due largely to the policy of cultural genocide carried out by German and Japanese troops in many of the countries they invaded. The Slavic countries in Eastern Europe suffered devastating losses. The official figure accepted at the Nuremberg Trials in 1945 for book destruction at the hands of the Germans was 100 million volumes in the Soviet Union alone. Belarus lost 95 per cent of all its holdings. The Polish National Library was burned to the ground. Chinese losses at the hands of the Japanese were also staggering – of the over 5,000 libraries existing in China before the Japanese invasion in 1937, only 943 survived in 1943 – and there was major library destruction in the last years of the war from aerial bombardment in both Germany and Japan.

One of the most important outcomes of the war in the sphere of library development was the Sovietization of libraries in those Eastern European countries which came under Soviet post-war occupation and which afterwards were ruled by one-party socialist governments. In these countries partisan librarianship was introduced to support socialism, public and research libraries were placed under the central administration of ministries of culture guided by Marxist ideology, and the concept of 'differentiated readership', developed in the Soviet Union, was used to

restrict the general public's access to materials deemed harmful to socialism. After the victory of the communists in China in 1949, a similar process took place on the Chinese mainland.

For the world at large, the most important development of the decade was the founding in 1946 of the United Nations Educational, Scientific and Cultural Organization (UNESCO), whose strong library development programmes would help to rebuild war-ravaged libraries and spread the techniques of modern librarianship to emerging nations everywhere. UNESCO's Constitution charged it with assuring the conservation and protection of the world's heritage of books, encouraging the exchange of publications, and 'initiating methods of international cooperation calculated to give the people of all countries access to the printed and published materials produced in any of them'.

## THE 1950s AND 1960s

As new sovereign nations began to emerge from colonialism in the decades following the Second World War, UNESCO became the major vehicle through which the principles and practices of modern library development were disseminated worldwide. Through consultant missions, pilot projects, publications and meetings it supported the building of library networks, archives and information systems from the early 1950s on. UNESCO's early emphasis was on public library development. A cycle of regional seminars on this topic was conducted from 1951 to 1962. Major pilot projects were begun in Delhi (1951), Medellín, Colombia (1954), Enugu, Nigeria (1957), and Abidjan, Ivory Coast (1963). By the late 1960s UNESCO began to prioritize education and training for librarianship, especially in the developing regions. UNESCO-supported regional library and information education programmes begun in Senegal and Uganda in 1963 were soon integrated into universities. UNESCO also assisted in the establishment of other university-level schools in Indonesia, Morocco, Jamaica, the Philippines, China, Venezuela, Ethiopia and Nigeria. The British Council and the United States Information Agency, both of which maintained large networks of demonstration libraries in the developing world, also offered international assistance in library development during this period. In China the new communist leadership used Soviet models to widen literacy and broaden public library activities in the 1950s and early 1960s, greatly expanding the public's access to the written record. (These positive developments in Chinese librarianship would come to a dramatic ten-year halt in 1966 with the beginning of the Cultural Revolution and its attendant mass destruction of China's cultural heritage.)

By the 1960s the Cold War between the Western capitalist countries and the socialist countries aligned with the Soviet Union began to have its own impact on library development in both camps, as each prioritized the circulation of up-to-date information to its scientists. In the Soviet Union the work of the All-Union Institute of Scientific and Technical Information (VINITI) in centralizing the collection, and in abstracting and disseminating of the world's published scientific information was a model for many countries seeking to keep their scientists current at the least cost. In the West abstracting services like *Chemical Abstracts* and *Index Medicus* operated increasingly as global archiving services of subject areas as well as current awareness services. The launching of the Soviet Sputnik in 1957 further accelerated spending on scientific libraries and information dissemination in the West: In 1959 the West German Technical Information Library (TIB) was opened in Hanover; in the United Kingdom the National Lending Library for Science and Technology (now the British Library Document Supply Centre) at Boston Spa was opened in 1962. In the United States the National Library of Medicine was opened outside of Washington, DC in 1969. It was during the 1960s that the attention of documentalists switched definitively from photo reprography (microfilm) to the potential of machine-readable electronic information. The term 'information science' was now used to describe research into the electronic collection, storage and dissemination of machine-readable information. The crucial development had taken place at the United States Library of Congress in the mid-1960s – the creation of the Library of Congress MARC (Machine Readable Cataloguing) format for communicating bibliographic data in machine-readable form. This new capability for converting, maintaining, and distributing bibliographic information soon became the standard format for sharing data about books and other research materials. The possibility of worldwide application was recognized, and in 1973, two years after the MARC format structure became an official national standard in 1971, it became an international standard as well.

## THE 1970s AND 1980s

These may be considered the decades of the most dynamic library development in the twentieth century, both on the level of international standardization and cooperation and on the technological front. UNESCO was at its most active in the 1970s. By the 1970s UNESCO's programme emphasis had shifted from public library development to overall national planning and promotion in the developing countries. A study conducted by UNESCO and the International Council of Scientific Unions (ICSU) led to the establishment in 1972 of the UNISIST programme fostering cooperation in the scientific and technological information field. A 1974 intergovernmental conference proposed the development of coordinated national scientific and technical information systems (NATIS), which would ultimately become the basis for UNISIST. NATIS was based on the principle that the best information on printed materials could be supplied by the countries in which they were produced. In 1977 NATIS and UNISIST were merged into UNESCO's General Information Programme (GIP). Guidance on policy and planning for developing countries was offered by guidelines, the conduct of national surveys of information resources and seminars. At the same time education and training for the information professions was strengthened by UNESCO, which collaborated with the International Federation of Library Associations (IFLA), the International Federation for Documentation (FID) and the International Council on Archives (ICA) in activities to further standardize professional education, especially in developing regions. UNESCO also supported the continuing education of professionals already in the field. Between 1977 and 1987 more than 100 courses were offered under contract with organizations and institutions

to 2,500 participants, with UNESCO covering part of the costs. But the withdrawal from UNESCO in 1984 of the United States and the United Kingdom meant that many of the GIP library development programmes had to be reduced to a fraction of their former size.

An important factor stimulating library development during the 1970s and 1980s was the increased involvement of the Soviet Union in supporting planning and training in less-developed countries in the socialist bloc, notably in Cuba and Viet Nam. Between 1974 and 1991 thousands of students from Latin America, Africa and Asia were educated at faculties of library and information science in the USSR, returning to their countries with an awareness of world standards in the field. The Soviet Union also supported from the early 1970s on its own International System of Scientific and Technical Information (MSNTI), developed in line with UNESCO's NATIS. The Soviets intended their international system to demonstrate the Soviet experience in information centralization, as well as international Soviet-led collaboration in information science. Furthermore, MSNTI was intended to compensate for the inability of hard-currency-poor socialist countries to pay for multiple copies of expensive Western journals.

In the West, these decades were characterized by: (1) the gradual but ultimately massive adoption of electronic technologies for routine library functions such as circulation and cataloguing; (2) the switching to electronic formats of traditional indexing tools such as *Index Medicus* (which in 1971 began operating as the online retrieval system MEDLINE); (3) the development of commercial host services providing software and telecommunications support offering remote users access to hundreds of databases (the largest such host being DIALOG, set up in the United States in 1972); (4) and the establishment of electronic library networks to permit individual libraries to share acquisitions and cataloguing information and to facilitate interlibrary loan. An important pioneer network was the Ohio College Library Center (now OCLC), founded in 1967. In 1971 it began online operations, making the Library of Congress's MARC cataloguing records available to member libraries as well as those cataloguing records created by member libraries. By 1977 OCLC was serving libraries in most of the continental United States and by 1990 it had extended the power of the computer and access to a multinational union catalogue to many libraries in Europe and Asia. Since then, other regions of the world have developed electronic library utilities similar to OCLC. The largest of these is the Dutch PICA system, serving libraries in a number of Northern European nations. By the end of the 1980s the attractiveness of electronic technology for libraries and the increasingly economical commercial availability of these technologies through personal computers had become the chief determinants of the future path of international library development. But the expense of these technologies, and the extent to which they depended on the existence of viable national communications infrastructures, increased the information gap between rich and poor countries.

## THE 1990s

For the library profession worldwide the most important phenomena of this last decade of the twentieth century have been: (1) the dissolution of the Soviet Union in 1991 and of all the library development programmes it fostered at home and abroad; (2) the global accessibility of the Internet and the World Wide Web; and (3) the development of digital libraries accessible by computer. The end of the Cold War was characterized not only by the massive pullout of Soviet aid to library planning in many emerging countries, but also by the switching of the focus of American library development aid from these countries to the republics of the former Soviet Union. In the industrialized world, the information-gathering behaviour of millions of citizens was changed by the availability from their home computers of the vast resources of the Internet – a network of networks which links up a global agglomeration of computer resources for public access. By 1997 the Internet comprised 25,000 networks, over 45 million users and was still growing exponentially. Originally designed by the US Department of Defence for its own scientists in the 1960s, the Internet has experienced phenomenal growth since 1990, and has attracted private and business users in great numbers. One of the most-used Internet services is the World Wide Web (WWW), with its Mosaic software for browsing documents on the Web's servers sited anywhere in the world. The WWW was started by the European Centre for Nuclear Research (CERN), using a form of hypermedia navigation. The easy accessibility of the Internet to any computer user with a modem poses enormous challenges to indigenous cultures and to the libraries which have traditionally stimulated and supported those cultures. Like satellite-broadcast television, Internet access has proven extremely difficult to control by sovereign governments wanting to restrict citizen exposure to alternative life-styles, which these governments regard as culturally threatening.

By the mid-1990s many libraries in industrialized countries were digitizing their conventional print collections so as to make them available electronically on the Internet. The creation and use of digital libraries is similar to the creation and use of traditional public libraries, since digital libraries contain information collected and organized on behalf of a community of users to supply the information needs of that community. Just as was the case with traditional libraries, digital libraries contain information in many formats and media and have been organized by corporate services, private institutions, government agencies, non-governmental organizations, volunteer groups, and religious and political organizations, among other creator groups. The revolution in practice is caused by the fact that the community for which the digital library is organized is a virtual one and may in fact be physically distributed all over the globe, along with the information it accesses. And the community's interaction is likewise virtual, not taking place within organizationally definable walls. Thus the entire environment of information-seeking, interaction and supply has moved into places that seem far beyond the influence of the librarians – into the office, the dormitory, the laboratory, the living room, public spaces. A number of methods have been developed within the global library profession to meet the challenge of digital libraries. There are several arguments for the continued maintenance of the library as a physical space, one of the most compelling being that most information is still not digitized but is available only in paper format. Another argument is based on the premise that digitized information is still inherently difficult to access, and the availability of professional assistance – in the person of a professional librarian – is vital. Currently the

most popular argument among public librarians, because of its obvious political and financial advantages, is that exactly because of the wonders of digitally available libraries, access to these riches must be made available through publicly funded libraries to all the country's citizens. This is the argument that underlies the US Library of Congress's 1994 decision to digitize the nation's 'patrimony', both print and graphic, through its National Digital Library. Many other cultural treasure-houses, such as the Vatican Library in Rome, have also begun digitizing their precious collections for worldwide access. By the late 1990s, librarians in the industrialized world had laid claim to the Information Revolution as part of their sphere, and were transforming their libraries into sources of electronic connectedness to the world's digitized information supply. The greatest challenge of the new century is that of extending this connectedness to libraries in the developing world.

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# 29.3.3

## THE DEVELOPMENT OF THE WORLD'S MUSEUMS

*Sid Ahmed Baghli*

### FROM 1914–1945

By 1914, museums were already highly respected institutions. In Europe and even America, some were venerable centenarians. These sacred temples, such as the Hermitage in St. Petersburg, the British Museum in London, the Louvre in Paris, the Prado in Madrid and the National Museum of Rio de Janeiro, possessed a valuable, jealously guarded cultural heritage. The museum was considered an institution that safeguarded works of art, archaeological collections and items of natural history.[1]

Preservation was paramount; technical and scientific collections were few and far between[2] and the educational aspect had not yet been recognized. People requiring access to the British Museum had to submit a written application complete with titles, wait for it to be assessed in order finally to receive authorization and then wait for several more months before being granted the privilege of visiting the museum![3] Following the terrible attacks carried out during the First World War, Western European museums came to a standstill. However, the October Revolution of 1917 had a profound influence on the development of museums in the East.

### The Soviet Union and Eastern European countries

Lenin created a state-run 'school of museums and heritage', whose main objectives were to preserve the cultural heritage and to contribute to education in science and art through museums.

In 1917, there were some 150 museums in the new Union of Soviet Socialist Republics (USSR). This figure rose to 400 in 1923 and to more than 1,100 in 1970. Historical museums underwent some major changes in terms of their content, presentation and public access. In 1977, there were approximately 1,400 state museums in the Soviet Union, nine times more than in 1917. By then, museums were specializing in fields such as art, archaeology, history and science and technology. The Polytechnic Museum of Moscow is an example of a large multidisciplinary museum. Museums attach great importance to the October Revolution and to the 'heroic struggle of the peoples of the Soviet Union during the national wars'.

The other former peoples' democracies in Europe also supported the development of their museums. Archaeological museums in Germany and Poland, open-air museums in Romania and industrial museums in Yugoslavia have been particularly successful.

The following figures represent the number of museums in certain socialist countries: USSR: 1,400 in 1977, 1,800 in 1985; German Democratic Republic: 700 in 1973, 748 in 1985; Poland: 657 in 1974, 750 in 1985; Romania: 331 in 1973, 331 in 1985.

### Western Europe and the United States

The rest of Europe, which boasts an impressive number of museums, took a little longer before it began gradually to implement reforms following the harsh criticisms made over several decades concerning these 'luxury attics', 'art graveyards' or 'retirement homes for the dead'.[4]

Dutch and Swedish museums were among the first to experiment with ways of making museums more accessible to the public and to young people in particular. They began to implement the first educational programmes. Between 1945 and 1963, the Stedelijk Museum in Amsterdam provided huge impetus to modern museology and later to 'open-air museums', which became a model that was followed all over the world.

Although art, archaeological and historical museums in particular still tended to hold exhibitions, the number of exhibitions varied. Large museums such as the Louvre in Paris introduced new techniques of lighting and of displaying certain masterpieces to the public.

A new type of interdisciplinary museum, the eco-museum, was also born during this period. 'An eco-museum is a mirror which a society chooses for itself; a museum of space, time and the whole human race', explained museologist Georges Henri Rivière. It provides an overall vision of humankind in its natural and sociocultural environment. Examples include the French eco-museums of La GrandeLande and Le Creusot-Monceau les Mines.

The following figures[5] give an idea of the increase in numbers of museums between the 1970s and 1980s. Federal Republic of Germany: 1,550 in 1975, 2,415 in 1985; Canada: 471 in 1976, 1,515 in 1985; Denmark: 300 in 1976, 331 in 1985; United States: 4,988 in 1976, 6,120 in 1985; France: 1,250 in 1977, 1,921 in 1985; Japan: 407 in 1976, 807 in 1985; Norway: 320 in 1976, 359 in 1985; Netherlands: 483 in 1976, 793 in 1985.

In the United States of America, museums of 'primitive art' began to appear at the same time as modern art and contemporary art museums. In the late 1950s, renowned architect Frank Lloyd Wright completed the Guggenheim Museum in New York, an immense snail shell with a reinforced concrete spiral inside, forming a gently sloping exhibition area six storeys high. 'Geology' and 'biology' museums became particularly popular in North America.

Europe remains the 'master' of the world's museums. Thanks to their number, wealth, variety and age, European collections are particularly important, since they represent virtually the whole of the global heritage. Germany, France (Plate 171) and the United Kingdom hold the lion's share in this respect.[6]

## THE GULF BETWEEN DEVELOPED AND DEVELOPING COUNTRIES

The growing gap between affluent countries and the poor Third World nations is largely due to the underdevelopment that created colossal debts of thousands of billions of dollars at the end of the 1960s.

The 500 museums spread across the whole of the African continent represent barely 2 per cent of the world's museums and less than half the number found in some Western European countries.

Despite their cultural wealth, the museums inherited from the colonial era bore a Western stamp that was far removed from national realities and aspirations. They were mainly European-style museums with an ethnographic flavour, often created to satisfy the administrative and mercenary colonial aristocracy.[7] The President of Mali, Alpha Oumar Konaré, later said that Western museum styles, which were out-of-date and inappropriate, should be 'killed off' and rethought in today's Africa. Fortunately, following independence, museums were designed in original, often ingenious ways, taking into account available resources and local needs. Mexico, India and Niger, among others, worked miracles in this respect. Through a slow but deep-seated process, changes were gradually made in order to place museums in the service of society. At the beginning of the century, the Egyptian Museum in Cairo was built to replace the Museum of Egyptian Antiquities, which dated back to 1857. Established in 1959, the Open-Air Museum of Niamey (Niger) was an authentically African museum, bearing witness to native customs. The Museums Association of Tropical Africa (AMAT-MATA), founded in 1959, included members from 22 African States (English- and French-speaking) by 1962.

Museums in developing countries did not really start to become known across the world until the 1960s, thanks to international museum campaigns organized by UNESCO and ICOM. Latin American and Asian countries began to reorganize their museums long before the African nations, which were still suffering from the legacy of colonialism and economic problems.

Argentina, Brazil, Chile, Cuba, Mexico and Peru are among the countries that actively improved their museum policies in terms of staff training and publications. UNESCO and ICOM worked closely together to organize the international museum campaign in 1956, which included seminars and round tables.

It was after the Second World War and decolonization that Asian museums began to grow, thanks to UNESCO and the Asia Pacific Regional Organization set up by ICOM. Art and archaeological museums were the most common, particularly in India and Thailand. In 1966, Iraq opened its huge national museum, equipped with a restoration laboratory, in Baghdad

## THE SUCCESS OF MUSEUMS IN THE SERVICE OF SOCIETY (1968–1990)

After 1960 and particularly the events of May 1968, museums were increasingly being examined under the microscope by professionals themselves. Artists, art critics and students across Europe called for the closure of 'middle-class', antiquated museums. They thought their collections should be scattered around in public places. 'Put the Mona Lisa in the metro!' they shouted in Paris.

The ICOM General Conference in 1971 accepted the principle of democratization, while the 1974 ICOM Conference in Copenhagen resolved to make every effort to promote the democratization and development of 'museums in the service of society'.

Indeed, museums began to embrace art, cinema, theatre and music and, in particular, became more accessible to local communities and young people. Pontus Hulten, art historian and curator of the Moderna Museet in Stockholm and later of modern art museums in Los Angeles and Paris, was constantly striving for museums to become 'the ideal place for communication, exchange, dissemination and reflection'.[8]

These developments, which affected all museums in every country, led to a real democratization, so that they became 'a dynamic instrument of a living culture'. Despite the serious socio-economic problems they faced, African museums grew and changed during the 1980s and 1990s as local museums were opened, collections were built up, exhibitions were organized and an increasingly skilled and active professional network was established.[9] All the strategic development work that was carried out ensured that new museums were created to meet the needs and match the real circumstances prevailing in Africa.

The remarkable round table held in Santiago, Chile, in 1972 highlighted the importance of the social role of Latin American museums and the reasons for creating a new type of museum: the integral museum, which was a kind of region-specific eco-museum.

A number of superb museums emerged in Mexico in the 1990s: half a dozen large museums were established, devoted to pre-Hispanic art, the history of Mexico City, Mexican anthropology, modern art and natural history. The museum of anthropology, which expresses the wealth of cultural identity, is an architectural and museological masterpiece. In Brazil, meanwhile, the modern art museum in Rio de Janeiro has also been very successful.

There are numerous natural history museums, but the most fashionable are the science and advanced technology museums, as well as planetariums, which have become extremely popular in Calcutta, New Delhi, Bombay, Nagpur and Lucknow. In 1970, Pakistan modernized its national museum. The national museum in Doha (Qatar) opened in 1976.

In fact, in the countries of the Near East, India and China, the cradle of the most ancient civilizations, the development of museums really took off during the 1980s.

The ecological, sociocultural and scientific concerns of museologists in France, Canada, Africa and Latin America led to the creation of a large international eco-museum movement during the 1980s. Mention should also be made of the large geology museum in London, which, in 1972, began to tell the story of the Earth, using a spectacular model of the galaxies.[10]

More than half of the museums in the United States of America are historical museums. Science and technology museums are the second most common, with art museums in third place.

According to a survey carried out in 1980, 68 per cent of Americans were in the habit of visiting museums. With its 16 museums in Washington D.C., the Smithsonian Institution alone was attracting 25 million visitors each year, a figure that climbed to 30 million by 2000! The Metropolitan Museum of Art in New York received more than 6 million visitors in 1980. At that time, a new museum was opening every three days in the United States.

The rapid development of museums led to the creation of new institutions in Japan: 'peace museums', such as those in Kyoto and Kawasaki. They described the grave legacy of the 1945 atomic bomb, although they gave an optimistic vision of the future. Understanding between peoples, tolerance and trust are expressions of this 'culture of peace' that is so dear to UNESCO. The same approach is adopted by the Museum of Tolerance in Los Angeles, which offers a futuristic presentation stimulating visitors' senses of taste, smell, touch, sight and hearing.

The Museum of Modern Art in Wakayama, Japan, built in 1994, dared to combine modern architecture with a traditional roof. In the same spirit as that which underpinned the construction of the Museum of Civilizations in Ottawa, Canada, in 1980, the Australian Museum in Sydney and the Te Papa Tongarewa museum in New Zealand provide a perspective of history that expresses the many viewpoints of aboriginals alongside those of Europeans, in a dialogue of peace.

## NEW MUSEUMS, NEW PERSPECTIVES SINCE 1991

The last decade of the millennium was marked by political, social and economic upheavals at the global level, which held back the development of museums in Eastern Europe and some developing countries.

In 1997, the national museum in Beirut, Lebanon, was reopened and the Nubia Museum in Aswan, Egypt, was inaugurated. The new national museum in Riyadh, Saudi Arabia, which was opened at the beginning of 1999, was established in collaboration with experts from the Royal Ontario Museum, offering a vast panorama of the country's tradition, culture and history.

The Getty Foundation used new technologies when it invested a billion dollars to build the Getty Center in Los Angeles, which opened in 1997; it is a grandiose fine arts museum resembling the Acropolis, and looks down over the city and the Pacific Ocean.

New information technologies offer museums tremendous possibilities for attracting visitors. Every day, for example, more than 4,000 people consult the Japanese website of the Louvre, which has become the most frequently visited museum on the Internet, ahead of the Metropolitan Museum in New York and the British Museum in London.

Is there a danger that the Internet, which makes museums accessible to people all over the world, might seriously reduce visitor numbers? In fact, 'in the emerging landscape of online images, the appetite for the original will only deepen, as people of all ages become better acquainted with the works of art'.[11]

The sheer scale of this virtual universe will increase museums' clientele, the only danger being that they may all look alike, whatever their geographical location, size, wealth or prestige. Will these virtual sites not constitute excellent means of preventing theft, looting and trafficking of museum exhibits and items of the cultural heritage?

## NOTES

1. Cf. *Mouseion*, Vol. 12, 1930, 'Le rôle social des musées' by J. Capart, p. 220.
2. The oldest museum of this type is the Deutsches Museum in Munich, established in 1903.
3. Cf. *Mouseion*, Vol. 12, 1930.
4. In the previous century, Théophile Thoré, had condemned these 'temples for the initiated' and advocated an 'open forum' for the public.
5. According to *La muséologie selon Georges Henri Rivière*, Dunod, Paris, 1989.
6. Germany: 4,682 in 1992; Austria: 712 in 1993; Spain: 1,054 in 1994; France: 1,300 in 1992; Holland: 732 in 1993; Greece: 268 in 1993; Italy: 3,442 in 1992; Norway: 475 in 1993; Russia: 1,478 in 1994; Czech Republic: 254 in 1993; Romania: 404 in 1993; United Kingdom: 2,000 in 1996; Sweden: 197 in 1993; Switzerland: 776 in 1993; Ukraine: 297 in 1993. (Source: *UNESCO Statistical Yearbook*, published in 1997. Only actual museums are included. Parks, zoos, botanical gardens and exhibition halls are not included. The figures for the United Kingdom were added to this list.)
7. 'The role of museums in today's Latin America', *Museum*, Vol. 25, No. 3, UNESCO, Paris, 1973.
8. Interview with Pontus Hulten, *Opus international*, Paris, No. 24/25, May 1971, p. 63.
9. The latest workshops in Africa: Mali, Ghana, Benin, etc.
10. Cf. *Museum*, 1974, Vol. 26 'Museums of exact and natural sciences'.
11. Maxwell Anderson, Director of the Art Gallery of Ontario, in *ICOM News, special 50th anniversary edition*, Paris, 1996, p. 22.

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# THE INFORMATION REVOLUTION
## TECHNOLOGY, METHODOLOGY AND INDUSTRY

*Michel Cartier*

## INTRODUCTION

It is impossible to fully describe the present revolution in information and communications technologies (ICTs), just as it is impossible to describe a train speeding along its track. At best, we can talk about its speed and its composition, what it seems to be carrying and its apparent direction. There are two main problems to adequately describing the many phenomena involved, and particularly their interrelationships. The first difficulty lies in describing how machines and technology have developed (*hardware*); the list of these inventions from 1945 to the present is long and relatively well known, but it is also rather insignificant because they converged to form new, more sophisticated systems several years later (Table 22). It is difficult to describe the evolutionary mechanisms that lead them eventually to converge. By the same token, the evolution of software and content has been insufficiently analysed to date. The second difficulty is that of describing the revolution produced in our societies by new communications devices, the Internet and CD-ROMs for example, and their impacts on all societies.

The concepts of information and information technologies have changed enormously over the past several decades, to the point where they now play a central role in the socio-economic systems of industrialized nations and are gradually assuming the same importance in developing countries.

Prior to the 1940s, information was synonymous with the acquisition of knowledge; in the 1950s there came the notion of controlling machines (cybernetics); after that, came the collection and processing of data, and recently, digital processing. During this time, information technologies metamorphosed into mass media around 1945, with the addition of a parallel stream of mainframe computers around 1960 and personal computers starting in 1980. Today, ICTs have emerged through the convergence of mass media and audiovisual technologies with computer science and telecommunications techniques, and particularly with a new element, which is changing the entire communications horizon: interactivity. Since 1945, change has been extremely rapid on all levels, as the following brief summary shows:
- The *nature of information*: from the acquisition of knowledge to digital data processing
- The *description of information*: from analysis of the real to simulated or virtual situations

- The *type of information*: from printed text to multimedia screen images
- The *volume of information*: from scarcity to a state of information overload
- The *type of user*: from several hundred experts to millions of users of the Internet, CD-ROMS or video games
- The *nature of the systems*: from mass media with no interactivity to systems which allow navigation in cyberspace.

The context of socio-economic discontinuity that we are now experiencing is accelerating all these changes. They reflect our society's need for new tools to help it adapt to both discontinuity and change. The following is a brief analysis of some of these tools: information, ICTs, the information highways and the content industry.

## INFORMATION

One of the problems created by the arrival of ICTs is the circulation of too much unsorted, unsynthesized information. The challenge of all these messages with vague, extremely mixed origins and destinations is to articulate units of knowledge in a reference system, to offer an organization whose structure allows storage, indexation and particularly retrieval based on the different criteria and search heuristics of multiple users. The systems we have used to date have processed data but now they must treat information; this calls for a redefinition of information. A piece of data has only two dimensions, 0 and 1, while information has four: subject, object (or properties), and the space and time in which it is current. Its treatment therefore requires a multidisciplinary approach drawing on psychology, sociology, computer science, and particularly in the case of documentation, on cognition.

In order to survive, human beings must communicate constantly: that is, exchange information within a society composed of various environments in a given time and space. They even manage to construct a model of this society in their heads, and their languages and cultures reflect this construction. For both its provider and its user, information is more than simply what is perceived in a message, it provides the material that helps construct society. Information is no longer the province of a specialized domain; it has become a basic strategic resource for society

*Table 22* **The evolution of ICTs**

| | Technologies | Information |
|---|---|---|
| **From 1900, particularly since 1945** | Printing<br>Photography<br>Film<br>Telephony (first generation)<br>Radio | *Content:*<br>audio and visual processing of raw data<br>*Interface:*<br>none |
| **1960** | Television<br>Cable television<br>Audiovisual<br>Satellites<br>Computers (mainframes) | *Content:*<br>analog processing of large volumes of organized data<br>*Interface:*<br>simple |
| **1980** | Personal computers<br>Desktop publishing<br>Photocopiers and fax<br>Electronic games<br>Video cameras and recorders | *Content:*<br>mixed (half analog, half digital) processing of personalized information<br>*Interface:*<br>more complex |
| **1990** | Information highways<br>CD-ROM<br>Automated teller machines<br>Consumer electronics<br>Specialized channels<br>Cellular telephony<br>Smart cards<br>Portable computers<br>Set-top boxes/meters | *Content:*<br>digital and multimedia processing of information on information<br>*Interface:*<br>personalized, real, simulated or virtual interactivity |
| **2000** | Intelligent environments:<br>home, office, automobile, etc. | *Content:*<br>value-added micromarkets<br>*Interface:*<br>incorporated in daily objects (therefore sophisticated) |

Note: The dates given above apply only to North America and refer to the period of mass commercialization rather than dates of invention.

as a whole. Within society, information is a phenomenon which is simultaneously economic (*news as a marketable commodity*), technical (*its content and form change with the nature of the medium*), social (*it refers to target groups*), political (*it implies power relationships*), and cultural (*it uses a particular social symbolism*). All major developments now depend on access to and use of information: virtually all new machines are machines whose purpose is information or communication. Henceforth, we must analyse information as a simultaneously economic, technical, social, political and cultural phenomenon, and the information society as one based on the industrialization of information.

**The value-added era**

The products of the new economy are termed 'value-added'. This value is that of the knowledge brought to bear in transforming a product, or data. It usually has important cultural connotations: user-friendliness, ease of access, cultural or linguistic adaptation, or mediatization of content. In an information society, the additional value is increasingly integrated in content that gives access to additional resources: applications, services, programmes, software and documentation in general.

**Information overload**

Since 1945, the development of distribution technologies has caused the volume of information to grow exponentially.[1]

We are not necessarily better informed just because more information is available, however. On the contrary, the increasing volume of information can lead to a narrowing of focus by citizens, encouraging 'tunnel vision'. The information one wants is often difficult to identify and retrieve from the mass of varied, unsorted information available; this leads to a phenomenon of 'exformation', that is, an accumulation of information which goes untreated due to lack of time and competent personnel. This tidal wave does not always reach its destination. ICTs and information highways are not much help; instead, they tend to participate in the creation of the 'information wall'.

**The emerging primacy of interactive visual information**

Over the past hundred years, the transition from lithography to photography and then to film, television and interactive electronic services has caused the emergence of an interactive visual culture in the West. Film and television had already brought the image to the fore of contemporary culture, but

*Figure* 5 **Information overload or the 'information wall'**
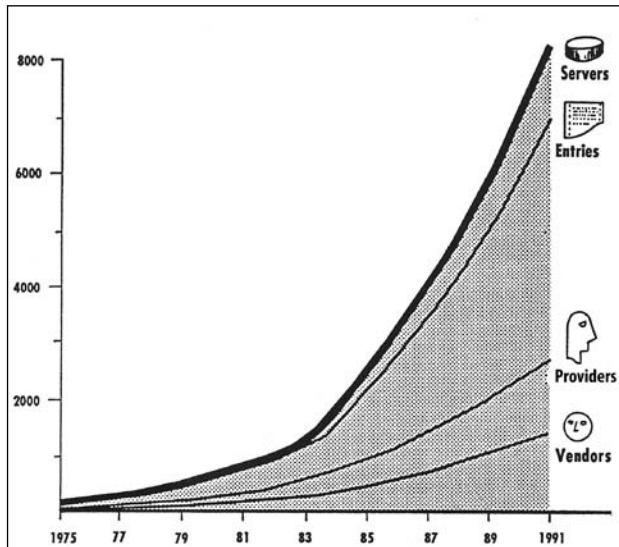


In North America between 1975 and 1991 the critical mass of electronically processed information increased dramatically:
– the number of servers increased from 301 to 7,637 (24 times);
– the number of entries increased from 311 to 6,291 (20 times);
– the number of providers increased from 200 to 2,372 (12 times);
– the number of vendors increased from 105 to 933 (8 times), each selling more than one service.
A similar exponential curve applies to the number of users of information highways; it has grown from several hundred in the early 1960s to over 30 million in 1994. As of September 2004, there were 812,931,592 Internet users in the world, with Asia (247,898,314 users) and Europe (230,886,424 users) outperforming North America (222,165,659 users).
*Source*: www.Internetworldstats.com/stats.
Faced with increasing volumes of information, it becomes impossible to process it without more sophisticated access and improved interface, navigation, and formatting. The transition from a situation of scarcity to one of overabundance will completely transform consumers' expectations.

they relied on mass diffusion, whereas ICTs now offer interactive visual communication.

Another very important transition: photography and film preserved the physical reality of things, offering the spectator the appearance of immortality; nowadays, ICTs transform the nature of contact between human beings and reality by offering simulations and 'virtual realities'. Before, the real was never questioned; today, with computerized imagery, the criteria of reality is *what seems* real and not *what is* real; interactive visual culture is becoming the kingdom of appearances. Three characteristics explain the emergence of this new interactive visual culture:

– digitization, which decomposes images and sound into micro-elements which can be reassembled at will to imitate reality or create fantasies;
– zapping, which allows information to be fragmented, demonstrating that scenarios are less and less constrained to follow chains of meaning;
– interactivity, which, by bringing technology and culture together, puts culture at the forefront of the development of user interfaces.

## INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs)

Faced with the sudden appearance of information highways,[2] philosophers are asking the following question: will information highways develop in a context of continuity or one of rupture? The question may appear academic to some. Nevertheless, if we believe that the evolution of our world is proceeding normally we should make certain decisions (deregulation of telecommunications for example); if we forecast that our world will be completely different in a decade, however, much more fundamental decisions must be made, such as changing our school systems, for example. The forces of change are difficult to manage, not only because they are new, but also because they are operating on a global scale and their capacity for upheaval appears stronger than any short-term hope for stability. The coming transition promises a rupture with the past; its positive aspects lie in its possibilities for innovation. But periods of transition are delicate and decision-makers will not be allowed any margin for error or naivety.

ICTs, particularly information highways, are the vehicles for the coming transition, just as the alphabet and the printing press were vehicles for important changes in the past. We move from one world to another when time and space change so much that our culture is modified, and when the new tools that society gives itself to facilitate the transition change its members' ways of thinking. These new tools are not responsible for social change, as is generally believed; rather, social and demographic transformations incite societies to create new tools that will enable them to better meet the challenges created by major changes, felt first in industrialized nations, and eventually in all countries. These challenges include:

– the entry into the workforce of millions of youth familiar with ICTs;
– the massive penetration of personal computers into the home;
– the digitalization of information technologies;
– the convergence of technologies with image and interactivity, etc.

The rise of major entertainment corporations and the emergence of information highways affect the state. We may be faced with the deconstruction of the nation state as an internal and external expression of identity, to the profit of both higher (large common markets) and lower (nationalisms) levels. One of the challenges of the twenty-first century will be to unify the large formations alongside the multiplication of minorities who want to affirm their identities. Industrialized nations recently recognized that ICTs and information highways have become a critical sector for their continued survival and modernity. In fact, one of the ruptures in the structure of our civilization is located in the typology of intelligence: extreme decentralization of knowledge and intelligence made possible by decentralization, which is facilitated by new information and communication systems that institutions use to reconstruct themselves.

Around the globe, the promise of a brighter future has withered. Today's society is tired. Its structures, like used motor parts, are unable to supply the performances we expect from them. The explosion of ICTs is the indication of a decisive stage for the world at a crossroads, a crossroads where many factors are entangled: societal, political, economic, and technological. Information highways, which

*Table 23* **New technology and media in the West: three stages of development**

| Author | Stage 1 | Stage 2 | Stage 3 |
|---|---|---|---|
| Alvin Toffler | Agrarian wave characterized by the occupation of territory | Industrial wave, characterized by mass production | A third wave characterized by information |
| Régis Debray | logosphere | graphosphere | videosphere |
| Marshall McLuhan | traditional galaxy | Gutenberg galaxy | Marconi galaxy |
| Luc de Brabandere | The aqueduct, a support for agrarian society | The Oleoduct (pipeline), a support for an energy-based society | The infoduct, a support for an information society |
| Joël de Rosnay | Agricultural revolution: renewable energy | Industrial revolution: concentrated energy | Information revolution: info-energies |

*Source:* Adapted from UNESCO, 1992, *Statistical Yearbook 1992*, UNESCO, Paris.

are both a support and a consequence of the society that uses them, will become the loudspeakers of these mutations, which they help accelerate and intensify for better or worse. They have already become a world event, a sign of things to come and, even in industrialized nations, a major concern of government, because they change strategic balances, and thus power relationships.

Although they label them differently, authors have described three stages of historical development in the West, as these relate to new technology or media (Table 23).

Each stage represents a leap in both the quality and quantity of information, a 'mediamorphosis'.[3] The transition from one stage to the next is made possible by the development of new media tools: writing, the printing press, and ICTs, which include information highways. These new tools have generated three communication codes, alphabets, typographical codes and mediacodes respectively, that is, new ways of mediatizing content that have changed our way of thinking.

If Gutenberg made us all readers and Xerox made us all editors, the personal computer transforms us into information producers and interactive media makes us all consumers.[4]

Certain beliefs are widely held in the field, and decision-makers often base decisions affecting our future on them. It is important to analyse these myths, which are often the result of media hype, because they are partially responsible for our present sluggishness.

This is more false than true. It is true that equipment and networks are undergoing rapid change. On the other hand, the software field is developing more slowly than forecast, while agreement on international standards is proceeding at a snail's pace. As for sociocultural acceptance of these new systems, it would be more appropriate to talk about resistance.

The cost of electronic circuits is truly low now, and the cost of personal computers is also decreasing year after year.[5] On the other hand, the cost of mediatizing content, which must be considered in determining total real costs, is rarely analysed in depth.

The society we live in today produces and diffuses more information than all previous societies together. A tidal wave of information is engulfing the mass media and information highways; we cannot, however, be certain that all this information reaches its target public, for several reasons:

- Not only are networks not universally accessible, but when they are, they are often incompatible, as has been the case with telephony and cable distribution for example.
- Present information sources are not credible; the mass media in particular are often perceived as rumour mongers.
- The user's capacity to absorb and interpret information remains limited, a situation that is aggravated by 'unfriendly' interfaces.

The progressive installation of the information society supposes an agenda. Many researchers have identified the various transitions (or paradigms) that we are living through, but unfortunately their reflections do not accord sufficient weight to the enormous social resistance or to certain historical factors; consequently, the conditions for these transitions and their time frame have not been properly analysed. We must specify our time frame for making these enormous investments profitable – investments that will be higher than we can presently foresee. Following are certain conditions for these transitions over the next two years.

## INFORMATION HIGHWAYS

The information highway is an intangible and immaterial subject, a mobilizing concept that evokes such strong images in our society that it is becoming a myth:[6] People feel that it will be the primary force behind the economic development of the twenty-first century.[7] The information highway has become a shared metaphor for the bonding of industries, which until recently had no common language: today they all speak digital. The term designates a unique concept, which refers to a number of groups of actors and several types of information highway, each serving different clients and markets. At the present time, there are a lot of near misses, traffic jams and even vehicles leaving the road; the development of ICTs and the early days of the electronic superhighway in particular are like a rodeo or an obstacle course.

The information highway is the result of the integration of a family of technologies that will become a new medium for business and domestic teletransactions It brings together various media elements that have traditionally been separate: data, voice, images and diagrams; it generates major economies of scale because of new critical masses of users and applications supported by complete digitization. It includes three principal elements, which are, in descending order of importance: the consumer, information and the technologies.

*Table 24* **Evolution of the information society**

| Past Transitions | New Transitions | Conditions |
| --- | --- | --- |
| Production economy | Knowledge economy | **Choice of niches** |
| National markets | Continental markets | |
| Manufacturing society | Information society | |
| Institutional structures | Network structures | **Reorganization of organizations** |
| Disappearance of permanent jobs (primary and secondary sectors) | Creation of new types of jobs (tertiary sector) | **Ongoing training in new competencies** |
| Technological convergence | Media convergence | **User-friendly** |
| Container | Content | **interactivity** |
| Broadcast | Narrowcast | |
| Expert system users | Novice general public | |
| Mass medium | Pay per view | **ICT literacy** |
| Textual access | Multimedia access | |
| Paper support | Electronic support | |
| Static document | Dynamic document | |
| National culture (given geographic territory) | Culture of affiliation (virtual territory) | **Cultural industry and industry of language** |

The information highway represents a new stage in the development of the emerging information society. It can be defined as follows, according to the three tertiary poles:[8]
 – Technical definition: a high-speed network, created by the convergence of telecommunications, computer and audiovisual technologies, linking existing networks and creating new ones, to form not one highway but several;
 – Economic definition: an international marketplace, composed of various distribution spheres in which clients consume content and business and domestic services;
 – Social definition: a new circuit between the information and service provider and the teleconsumer, that is, between supply and demand.

The information highway era began with electronics in the 1970s. It is organized differently than in previous eras, which were founded on matter and energy, rather than constructing a new world of time and space combined. Information highways are metaphors for a global organization which processes and exchanges information. Functionally, networking ensures flexible (thanks to multiple paths), cheaper and less expensive communication between consumers. It is based on existing infrastructures (data networks, satellites), known supports (copper wire, coaxial cable, fiber optics), knowledge (digitization, compression), and techniques that are being developed (ATM, etc.). Infrastructure is like a backbone. Once you have infrastructure, the whole economy follows. The slogan of its promoters seems to be 'Faster! Smaller! Cheaper!'

Virtually all discussions of information highways start with a description of the technology, and unfortunately most of then stop there. Furthermore, official reports repeat essentially the same dominant ideology:
 – *We have to build the networks first, because they will generate* (magically?) *content*. This is the ideology of the primacy of infrastructure over content.

 – *We have to act fast, because the whole world is lagging behind the United States.* This is the ideology of the primacy of short-term projects over longer-term planning of the type of society we want.

**Base architecture**

An information highway is a network of networks that communicate with each other via telephone lines, coaxial cable, fiber optics, specialized high-speed lines, broadcast transmissions and satellites, which link a variety of elements:
 – A backbone of high-speed central networks called wide area networks ($WAN$), high throughput lines, satellite information highways, teleports, stations with large parabolic antennas.
 – Local networks: routers, local hosts and servers ($MAN$, $LAN$) each with an electronic name and address.
 – A communication device: a computer, modem, memory (magnetic, optical, PCMCIA, etc.), printer, or in certain cases a television equipped with a set-top box,[9] keyboard.
 – Protocols and software in the gateways: telecommunications (e.g. TCI/IP), coding/decoding, sorting, classification and research (e.g. Archie, Gopher, WWW), access, etc.
 – Basic services (in the client-server mode): connection to local networks, electronic file transfer, electronic mail, etc.
 – Content: resources, applications, documentation, software and other services.
Information highways have certain characteristics:
 – Open standards: their specifications must be available to everyone and in certain cases be made public;
 – Interoperability: they must allow communication between a variety of disparate systems;
 – Standardized access: books can be easily found in libraries because there is a standard consultation mode. Similarly, non-standard documents on

information highways will make life difficult for users as well as for systems.

Documents transmitted on information highways must also have certain technological characteristics:

– we must be able to digitize them and store them in computer memory;
– we must be able to re-edit them in different ways: they must therefore be more flexible than their paper counterparts;

– they must be digital to facilitate their rapid, low cost redistribution;
– they must be accompanied by instructions for their multimedia or plurimedia use, as applicable.

## THE CONTENT INDUSTRY[10]

Before they became a technological adventure, information highways were an American project whose objective was to allow the industry players (in the major entertainment

*Figure 6* **The anatomy of information highways**
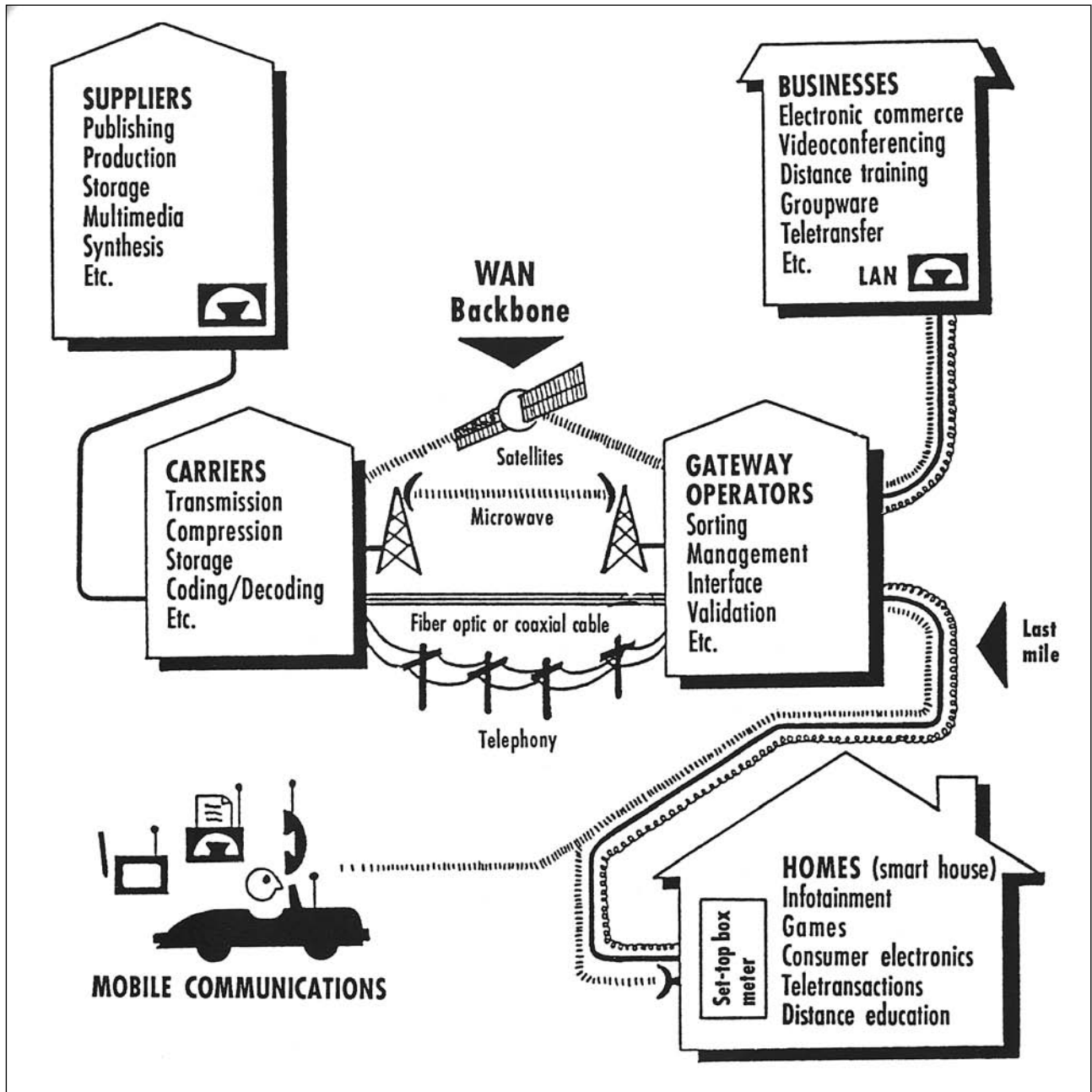


This diagram illustrates, the central core or backbone of the information highway, which uses a variety of technical solutions: satellites, fiber optic or coaxial cable, or telephones. According to whether they are directed to homes, businesses or mobile communication stations, information highways adapt to different environments, markets or consumers. The whole forms a new medium particularly suited to residential or professional teletransactions. It is the battlefield of the major American entertainment corporations.

corporations) to take control of the content industry worldwide by the turn of the century. They would be the electronic marketplaces of the information society, an immaterial society in which information and knowledge are carried by electronic bits that can be copied over and over again. These bits form the economic base of this industry and the backbone of this society.

This industry develops in waves, each a hybrid that encompasses what has gone before. The phase that is starting now is the result of technological (digitization, and particularly compression) and media (hypertext and multimedia) convergence. This evolution causes the convergence of many activities in information highways and generates new types of economic relationships:

- new exports generated by the continentalization of markets;
- the reconversion of much content that was previously transmitted using analog technologies;
- derivative products, since there are close ties between *on-line* and *off-line* products; and
- tourism.

These activities also have a direct impact on certain noncommercial elements that are nevertheless essential to society:

- the evolution of language and culture, essential for the adaptation of people's ways of thinking to social and technological mutations.

This industry ensures the design, production, management and distribution of information to meet the needs of the emerging information society. It is based on 'grey matter' rather than capital, raw materials or energy, and its structure is more complex and more fluid than that of traditional industries. It emerges as the triumph of liberalism and capitalism, the liberalization of commercial trade across national boundaries and the arrival of new capital investment by new actors who are attracted by potential profits. This industry is developing through simultaneous economic, industrial and technological integration brought about by the creation of alliances between major players. Information highways cause a shift from a market of traditional manufactured products based on offer (*technology push*) to a market based on demand for information (*demand pull*), which becomes the currency of the new economy. This economy is gaining strength with the emergence of electronic marketplaces where increasing numbers of exchanges of all sorts are taking place. Its characteristics:

- a quaternary sector;[11]
- sudden, almost phenomenal spurts of growth in specific niches, frequent deep restructuring and rationalization;
- an emphasis on added value;
- a new socio-economic model;
- methods of payment (such as set-top box/meters) adapted to ICTs (source authentication, validation of demand);
- data encryption;
- activities in real time.

The characteristics of its content are as follows:

- Interactive content: This content requires a human presence. Because of interactivity, the messages are less and less a chain of data and more and more an open, adaptable process. This interactivity may be more or less complex. Another novelty: the screen becomes an element of the message (icons, multiple windows.)

- Content kits: The consumer does not want to be drowned in 500 channels but is looking for a bit of information to compare with others and respond to. The nature of content is changing; gone are the long chains of screen images; content is fragmented in a mosaic of elements whose meaning is reconstructed at will by the user.
- New technical reception: Content is transmitted digitally and no longer through traditional analog channels such as film or television.
- Multimedia content: Thanks to hypertext, texts, sound and images are converging. An artificial mental space is being both created and used by the participation of media designers and consumer/users.
- Distributed content: The value of products is increasingly a function of the cost of their distribution and marketing: cost of distribution per bit, market forecasts, publicity.

The new techniques that this industry's promoters must master are:

- compression, which after sampling, compacts data that is not useful or is less significant than the original signals, in order to occupy as little space as possible in computer memory or on transmission bandwidths ;
- portability, which allows content to adapt to various norms and thus to circulate through different systems;
- encryption, which encodes a message so that it can only be read by the target receiver;
- bi-directionality, which allows a telematic system to transmit information in both directions, thus facilitating interactivity and two-way communication.

**A world market**

Twenty years before the organization of the ad hoc Clinton-Gore US presidential campaign committee, which launched the Information Superhighway, many spokespeople in the industry had tried to attract Americans' attention to their industry as the market of the century. These attempts were highly publicized. 'This is by all odds the most important, lucrative marketplace of the twenty-first century.'[12] In 1994, its total income was approximately $400 billion of the world total of $900 billion; if information highways succeed in capturing only a part of this market at the outset, it will have been worth it. Revenues generated by this mega industry were projected to exceed 3 trillion dollars worldwide by the year 2001.[13]

The 'mega-majors'[14] have clearly identified the market of the century: the sale of information to offices and homes throughout the industrialized world; their motto has become *Anyone, Anywhere, Anytime*. Alliances are being arranged to take control of the world information industry by the turn of the century: 'Within five years, the whole world will be organized into two or three camps, four at the most.'[15]

**An industry that will fundamentally change our society**

A lot has been written about the mutations ICTs cause in our societies, yet it is economic transformations made possible by these technologies that will change our society the most

*Figure* 7 **Organization of the content industry**
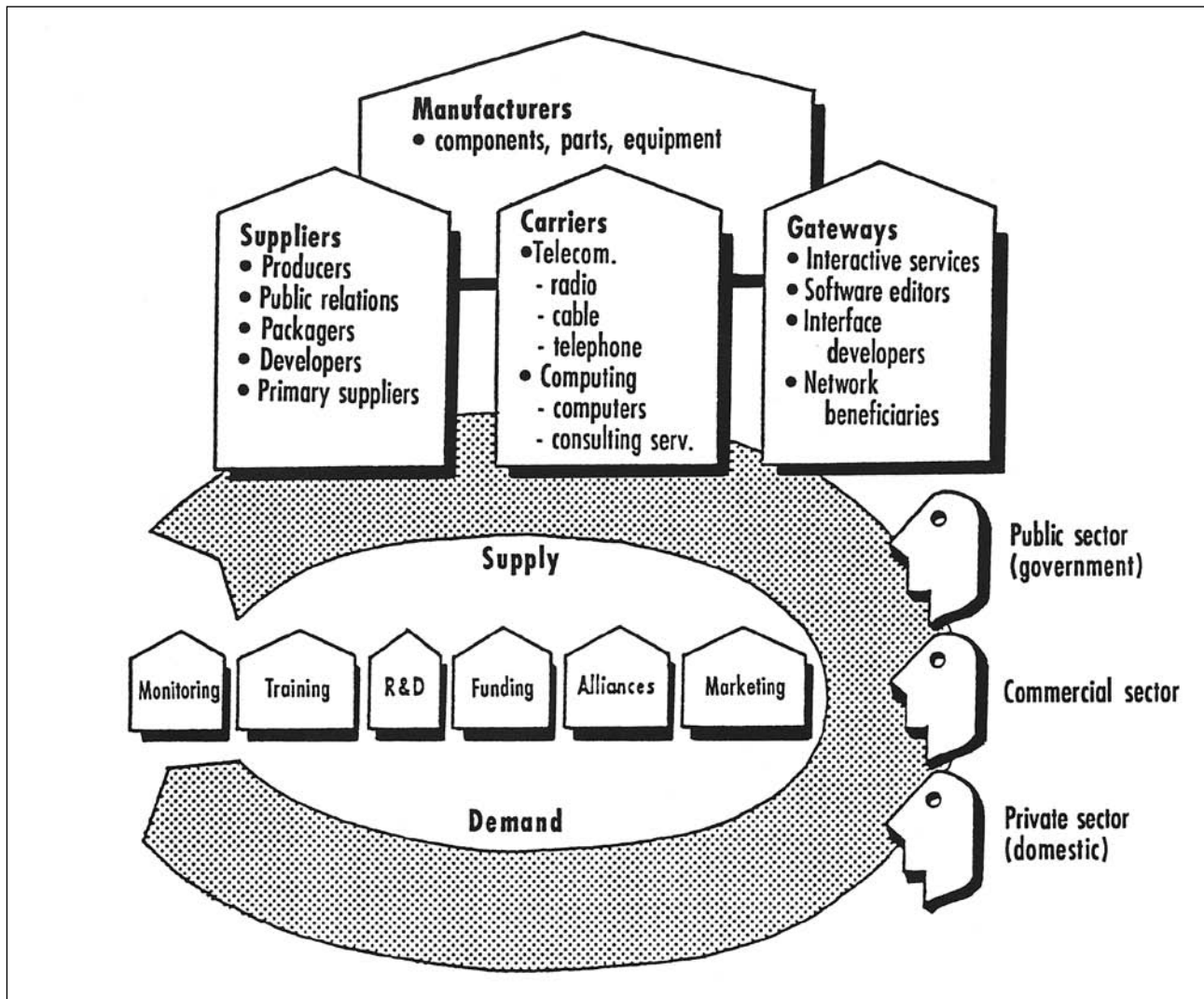


- —This complex, hybrid industry develops from both the content and the container. A growing number of formerly isolated actors are found in closer and closer association.
- —Certain actors supply, transport and deliver content to consumers. All are supported by manufacturers, which provide components and equipment.
- —The industry has three target sectors: public or governmental, commercial, and private or domestic.
- —This industry requires supporting actions from society: monitoring of technological developments and strategies, a sufficiently trained workforce, basic and applied R&D, funding of these activities, the development of alliances, and dynamic marketing.
- —All these activities and investments will require the increasing integration of actors, both private and governmental, to confront the major entertainment corporations.

fundamentally. Not only will its development be more costly than forecast, it will also produce unforeseen consequences for both the citizen/consumer and the state, because the space and time in which state, citizen and new markets are operating are different from what they were before 1990.

This economy will be global, that is beyond all control, since the mega-majors are not accountable for their actions; they need not respect the principles of legitimacy that apply to relationships between the citizen and the state. 'Everywhere, national champions become international networks with no particular attachment to any nation.'[16] As the state has ceded a part of its jurisdiction, and has consequently become weaker, these new masters of the world will control the key elements of power in their field: access to funding, markets and new

technologies. This industry will be a new anonymous, stateless power. Furthermore, few question the consequences of such a scenario, although they are foreseeable: dilution of the state resulting in a decrease in services (health, education, environment), the emergence of a new class of the info-rich, and the end of free trade to the advantage of the major entertainment corporations.

## NOTES

1. In industrial society, the volume of scientific and technical information increases by 13 per cent annually, whereas in an information society this rate increases to 40 per cent.

2. *Information Highway, net, web, cyberspace, electronic frontier*, etc.

3. Expression coined by Joël de Rosnay in *L'homme symbiotique (Symbiotic Man)*.

4. Inspired by Marshall McLuhan.

5. According to Joyce's Law: At equal power, the cost of computing falls by half every ten year*s*, although this apparent improvement cancels itself out with the need to add new 'options' and additional memory in order to use increasingly sophisticated software when buying a new computer.

6. The myth of a cyberspace that gives users the impression that they are in the same room as the person they are communicating with. This myth was inspired by William Gibson's 1984 novel, *Neuromancer*. In Gibson's words, 'There's some kind of actual space behind the screen. Some place that you can't see but you know is there.'

7. Each economic cycle is characterized by the emergence of an activity that drives growth: railways around 1800, the automobile around 1900, services in the 1980s, etc. See the research of Kenneth J. Arrow.

8. A tertiary society has three poles: social, economic, and technological.

9. Set-top box that counts and charges for rights to information or a service on a pay per use basis.

10. Also called the information industry, cultural industry, digital industry.

11. All economic activity can be classed in three sectors. The tertiary sector includes services and, more generally, all activities that cannot be classed in the two other sectors. In order to clarify this 'catch-all' tertiary sector, we have baptized services related to the communication and transmission of information the 'quaternary sector'.

12. US Vice-President Al Gore, *Time*, April 12, 1993.

13. Hypothesis supplied by John Sculley, former president of Apple.

14. The new masters of the world (see the book by the same title, 1995) are Bill Gates of Microsoft, Disney's Michael Eisner, Ted Turner of CNN, Rupert Murdoch of News Corp., Barry Diller of QVC, Frank Biondi of Viacom, John Malone of TCI, Gerald Levin of Time Warner, Conrad Black of Hollinger, Steven Spielberg of DreamWorks, and the presidents of Sony, AT&T, Matsushita, Bertelsmann, etc.

15. Craig McCaw, then president of McCaw Cellular Communications, *The Wall Street Journal*, 10 May 1993.

16. Robert Reich in *The Globalized Economy*.

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# 29.5

# DEVELOPMENT OF INTERNATIONAL LANGUAGES

*David Dalby*

## INTRODUCTION

By 'international languages' we designate all those languages that have served during the twentieth century as important means of communication among the populations and/or governments of several different countries or nation-states.

As peoples have spread around the world, they have taken their languages with them, each of those languages having normally been in contact with one or more others, in a system of permanent influence and frequent replacement. The spoken languages of humanity have always formed part of a continuous system of communication around the inhabited parts of the globe, although until modern times this system was composed of long sequences of fragile links among bilingual speakers of individual pairs of languages. This worldwide linguistic system, or logosphere,[1] has been strengthened by the gradual development of written languages during the last five millennia, by the much more rapid explosion of printing that began five centuries ago, and by the telecommunications revolution of the twentieth century.

Gutenberg's printing revolution in the fifteenth century helped stimulate ideas of adventure and exploration, and before the end of that century Columbus and his successors had closed the last gap between the eastward and westward extremes of the logosphere, across the Atlantic Ocean. The way was then open to the worldwide expansion of a handful of European languages, as well as to the parallel development of creoles partly derived from those languages, leaving linguistic imprints around the globe along the pathways of colonial empire.

In considering the history of individual languages within the logosphere, great care should be taken not to confuse languages with peoples, or even languages with cultures. Individual languages are of course endowed with whatever specialized vocabulary may be required for the cultural and other interests of their speakers, often including items inherited from written sources or copied from other languages, and it is also evident that each language and each local variety of a language has a central role to play in the ethnic or social identification of its native speakers. On the other hand, languages are functional means of communication that are intrinsically neutral, and which may be used to convey noble or ignoble ideas depending on those who speak or write them. So it is that the languages spread most widely in the world have been used to organize slavery,

genocide and the trafficking of arms or drugs, but have also been the means for promoting and diffusing the common ideals of liberty and justice and for dispensing humanitarian aid. It should also be borne in mind that peaceful relationships among different language communities have usually been associated with gradual linguistic change and exchange, whereas war and violence have frequently led to the more abrupt replacement of one or more languages by another.

The most rapid development in the history of the logosphere took place during the twentieth century, and is discussed below in terms of the geographical extension of individual languages, without indulging in speculation about how many million people may speak or understand each of these languages. The main purpose of our discussion is to determine which languages have provided means of wide communication among different ethnic groups, nation-states and continents, and it will be convenient to review the history of their development during the twentieth century in terms of three key dates:

- 1914, marking the end of a period of Global Colonization by the major European powers, during which the use of their respective languages had been widened and strengthened throughout the world;
- 1945, marking the end of the period of the two World Wars and the beginning of the period of Global Decolonization and the Cold War;
- 1989, marking the end of the Cold War.

## THE SITUATION IN 1914

The use of international languages in 1914 mirrored the extent of the eleven corresponding empires which together covered vast areas of Europe, Africa, Asia and Oceania, and previously the whole of the Americas. In alphabetical order, the linguistic role of each of these empires can be summarized as follows.

- The British Empire had accompanied the use of the English language from the British Isles to all the continents, where English had established itself (together with the creoles derived from it) as the most widely spoken language of North America, the Caribbean and Australasia. It had also taken root as a colonial language in parts of western, eastern and southern Africa and across wide areas of southern

Asia and Oceania, as well as in Hong Kong. The growing economic power of the USA, originally a federation of Britain's North American colonies, was already adding weight to the worldwide power of the English language. Unfortunately, the spread of this language was associated in some areas, especially North America and Australia, with the displacement and dispersal – even genocide – of many smaller language-communities.

– The French and Belgian empires had together helped to spread the French language from Europe to every other continent (western and central Africa, south-eastern Asia, Oceania, French Guiana in South America), including its continued use in former French colonies in North America (in Quebec, and to a lesser extent in the Canadian Maritime Provinces and Louisiana). This international diffusion of French was reinforced by its long-standing use as the international language of diplomacy and of European elitist culture (as used, for example, in the aristocratic societies of Russia and Poland). More popular, creolized forms of French had established themselves in areas as far apart as the islands of the Caribbean and Indian Ocean. In many parts of France itself, and in adjacent areas of Belgium and Switzerland, other related and unrelated languages (like Provençal or Walloon or Breton or Basque, referred to disparagingly in French as 'patois') continued to be spoken, but compulsory education and military conscription had been doing much to reinforce the use of French in all areas and in all social classes.

– The German and Austro-Hungarian empires together ensured the primacy of the German language over a vast area of Europe, from Alsace and Lorraine in the west to the Baltic Sea in the north, the Carpathian Mountains in the east and the Adriatic Sea in the south. The German empire had also carried the German language to Africa (Togo, Cameroon, Tanganyika, Rwanda, Burundi and South-West Africa) and to Australasia (New Guinea and islands of the western Pacific), while largely Protestant émigrés had established German-speaking communities around the world, especially in Russian Asia and in the Americas.

– The Japanese empire, the most recently created of the ten colonial empires, had already carried the administrative use of the Japanese language to the linguistically related Ryukyu Islands, to Taiwan, to Korea and Manchuria, and to southern Sakhalin Island.

– The maritime Netherlands Empire had maintained the use of the Dutch language in what is now Indonesia (the Netherlands East Indies) and in parts of the Caribbean (the Netherlands West Indies, together with the colony of Surinam in South America). Closely related Flemish forms of the Dutch language, largely from what is now Belgium, had been carried by émigrés to southern Africa, where they evolved as the first language (Afrikaans) of the emigré's descendants, as well as of many people of mixed descent, especially in Cape Province (where the language is known also as Kaaps).

– The Portuguese empire had formerly included Brazil, which by 1914 already accounted for more speakers of the Portuguese language than Portugal itself. The empire still included countries in Africa, where the use of Portuguese, and of Portuguese-based creoles as a first language, had been established for centuries (former Portuguese Guinea and the islands of Cape Verde, São Tomé and Principé). In Angola and Mozambique, Portuguese was used by settlers and administrators, and was also in the Pacific, in East Timor and Macao. Vestiges of Portuguese creole survived in India, Ceylon and Malaya.

– The Russian empire had carried the Russian language, spoken by settlers and administrators, eastward beyond the confines of Europe into central and north-eastern Asia and also westward into Poland and Finland. In North America, it had been displaced by English from its brief foothold in Alaska, sold by Russia to the USA in 1867. The isolation of a vast region of Europe and Asia, dominated by the Russian language and protected by a *cordon sanitaire* of police and customs controls, had begun almost a century before First World War (Tsar Nicholas I, from 1825) although the French language was used extensively by the Russian aristocracy as their own elitist language within the tsarist empire.

– The Ottoman Empire carried the Turkish language far into Europe from the fifteenth century, reaching the gates of Vienna in 1529, but had been in decline during subsequent centuries. Turkish withdrawal from the Balkans was already well underway by 1914. Over the remaining parts of the Ottoman Empire in south-west Asia (the 'Middle East') and through the former Ottoman possessions in North Africa, the Arabic language remained the dominant linguistic link.

– The Spanish empire had ceased to exist before 1914, apart from footholds in north-east and Equatorial Africa, but it had left the Castilian – or Spanish – language as the major language of communication from the south-west frontier states of the USA as far as the southern tip of Chile and Argentine. With the exception of the three Guyanas, the whole continent of South America was by now dominated by the two very closely related languages of Spanish and Portuguese, both associated – like English – with the frequent dispersal or genocide of smaller language-communities. In the Pacific, Spain's cession of the Philippines to the USA in 1896 led to the rapid replacement of Spanish by English as the external language of administration and Western education.

Of these eleven empires associated with the international spread of nine languages, two were already moribund: the Spanish and the Turkish empires. It was the decline of the Turkish Empire which precipitated the onset of the World Wars from 1914, leading directly or indirectly to the collapse of the other ten empires over the next seventy-five years. Significantly, the linguistic impact of this collapse was far less than the political, and all the above languages are still playing a significant international role at the beginning of the twenty-first century.

An important linguistic legacy of the colonial empires has been the many creole languages around the world, which have drawn their lexicon from metropolitan European languages, but their syntax and phonology from African or other non-European languages. Those based lexically on

English and French are the most widely distributed, and have remained international throughout the twentieth century, in the sense that their national varieties are often inter-intelligible. One group of English-based creoles is found in the Caribbean and West Africa, and another in Oceania, and the French-based creoles are spoken mainly in the Caribbean and the Indian Ocean.

## THE GEOLINGUISTIC IMPACT OF THE WORLD WARS: 1914–1945

In linguistic terms, the period of the world wars saw German-speaking Europe opposed to most of French-speaking, English-speaking and Russian-speaking Europe, with multilingual Switzerland remaining a neutral 'island'. The global extension of the conflict came to involve most other major languages and most other parts of the world. The linguistic changes brought about during this period can be discussed in terms of the following international languages, in alphabetical order:

– The Arabic language, in its modern standardized form, gained in international importance during the inter-war period, with the progressive independence of Arabic-speaking countries, first from the Ottoman Empire and then from Britain and France (Egypt in 1922, Iraq in 1932, Syria and Lebanon in 1943–45). The Arab League was founded in 1944–45, just before the end of Second World War.

– The English language began to replace French as the major language of international communication from the end of the First World War, and assumed new importance in continental Europe after the Allied landings in Italy and France during the Second World War. Until 1919, French had been the generally recognized diplomatic language for international treaties, but in that year the Treaty of Versailles was drawn up as a bilingual document, in English as well as in French. The colonial empire administered through the use of English was also expanded by mandates received from the League of Nations after the First World War, when a number of colonies passed from German to British, South African, Australian or American control (west Togo, west Cameroon, Tanganyika, South-West Africa, east New Guinea and parts of Melanesia). A number of Arabic-speaking countries also passed from Turkish to temporary British rule (Iraq, Palestine, Transjordan), while Egypt was administered as a British protectorate from 1914 to 1922.

– The French language benefited likewise from mandates at the end of the First World War, with the transfer to French or Belgian control of several German colonies in Africa (east Togo, east Cameroon, Rwanda and Burundi) and with the transfer to French control of two Turkish colonies (Lebanon and Syria). From 1919, the French language was reimposed as the judicial and educational language of Alsace-Lorraine (previously German, from 1871).

– The German language lost its worldwide importance with Germany's loss of all its colonies in Africa and Oceania during or after the First World War. During the Second World War it enjoyed a brief expansion as the language of the Third Reich and was then the dominant language throughout most of Europe. Violent reaction at the end of that war led to the expulsion of many German-speaking communities from eastern Europe, including some who had been settled there for centuries, as well as the second reimposition of French as the judicial and educational language of Alsace-Lorraine (temporarily German, 1940–44).

– The Italian language, established in Somalia and Eritrea as a colonial language from the late nineteenth century, was extended more widely in Africa with the conquest of Libya, completed in 1932, and of Ethiopia, completed in 1936. This expansion was short-lived, however, all these colonies being occupied by the Allies in 1941-1942.

– The Japanese language, during and after the First World War, replaced German as the administrative language of the Marshall, Marianne and Caroline Islands. Before and during the Second World War, it was carried by conquest to Inner Mongolia and north-east China, to Hainan and the south China coast, French Indo-China, Thailand, Burma, British Malaya, the Dutch East Indies, the Philippines and the western Pacific. This sudden expansion was short-lived, however, and ended with the collapse of the Japanese empire in 1945.

In the closing months of the Second World War (San Francisco, April to June 1945) the United Nations Organization was established and the following six international languages were accepted as its official languages (in alphabetical order): Arabic, Chinese, English, French, Russian and Spanish. Among these, English and French became the working languages of the UN administration.

## THE GEOLINGUISTIC CONSEQUENCES OF DECOLONIZATION AND THE COLD WAR: 1946–1989

– The Arabic language was strengthened in its international role after the end of the First World War by the independence of further Arabic-speaking or partly Arabic-speaking states from French, Spanish and British control (including Libya in 1951, Sudan, Morocco and Tunisia in 1956, Chad and Mauritania in 1960, Algeria in 1962).

– The Chinese (Mandarin or putonghua) language, with the highest number of speakers in the world, is spoken largely within China itself, including Taiwan. This gives it an extension through a large part of Asia, from the Himalayas to the frontiers of Siberia and from the frontiers of Kazakhstan to the Pacific coast, including non-Chinese-speaking areas to which the language has been carried by administrators and settlers (Tibet, Xinjiang and Inner Mongolia, with parts of Qinghai, Sichuan, Yunnan and Guangxi). Chinese (Mandarin) is an official language also in Singapore. From 1945, Chinese assumed global status as one of the official languages of the UN and has been consistently used as such by the representatives of the People's Republic of China since they took over the UN seat for China in 1972. The most widely spoken variety of Chinese outside China has been Cantonese (or Yue), which has continued to spread with its speakers from southern China, including Hong Kong,

throughout the Pacific and Australasia and to southern Africa, North America and Western Europe.

– The Dutch language, established as a colonial language in both the Caribbean and Oceania since the seventeenth century, lost much of its international importance with the loss in 1949 of the Dutch East Indies, which had already been occupied by Japan from 1942 to 1945. When this vast chain of islands became independent as Indonesia, the use of Dutch was replaced by Indonesian as the national language and by English for contact with the outside world. Standard Dutch has nevertheless remained the official language of the Netherlands, of Belgium (jointly with French and German), of Surinam and the Netherlands West Indies, while its close relative Afrikaans is still widely spoken in South Africa and Namibia.

– The English language, already more widely used around the world than any other language, increased rather than decreased in importance during the period when Britain's colonial empire was dismantled. The process began with the independence of India in 1947, when the Indian government looked forward to the replacement of English by Hindi. In fact, however, the multilingualism of India, plus the opposition to Hindi expressed by speakers of many other, especially Dravidian, languages, led to English continuing to be the principal vehicular language of that federal country.

– The French language has a unique position within the logosphere, as the only language to enjoy such wide distribution as an administrative and vehicular language on the basis of such a relatively small extension as a mother tongue. Apart from an area in Europe bounded by the English Channel, the Mediterranean, the Pyrenees and the Alps, and a second area in North America along the banks of the St Lawrence River, the French language is spoken around the world primarily as a second language. The linguistic loyalty of former French and Belgian colonies in Africa, encouraged by France's policy of economic and – where necessary – military support, has ensured that French remains the second most widely used language in the debates of the United Nations.

– The German language, including standard 'high' German and a wide variety of regional forms, remains numerically the most important mother tongue in Europe, excluding Russia. It is today spoken as a majority or minority language over wide areas of western Europe, including Germany, Austria, Switzerland, eastern Belgium, Luxembourg, northern Italy and eastern France, and marginally in southern Denmark. Its use by German-speaking minorities in Eastern Europe and central Asia has been greatly reduced, but not eliminated. German is still used by many Protestant religious communities who emigrated from Europe in recent centuries to the Americas and Australia.

– The Hindi and Urdu languages, associated respectively with the Hindu and Muslim religions and alphabets, are largely inter-intelligible in their spoken form. They gained importance with the independence of India and Pakistan, respectively, but their spread throughout the subcontinent was checked by opposition from the speakers of other major languages in the area, including the Dravidian languages of southern India, and Bengali in eastern Pakistan (now Bangladesh). Hindi has benefited from the modern cultural force of a strong film industry.

– The Italian language, after the independence of Somalia in 1960, has retained only a vestigial presence in north-eastern Africa, but continues to provide a link between Italy and Switzerland, where it is an official language alongside German and French.

– The Japanese language, despite the end of the short-lived Japanese empire, has benefited from the post-war economic success of Japan, and is now studied as a foreign language in many parts of the world, especially in Australasia and the Pacific.

– The Malay and Indonesian languages are inter-intelligible, and represent a modern standardization of the Malay vehicular language long used for maritime trading purposes, and encouraged by the British and the Dutch, throughout wide multilingual areas of South-East Asia and the Indonesian islands. Since the independence of Indonesia, when Indonesian filled the vacuum left by Dutch, the use of Malay and Indonesian extends today from the Malaysian Peninsula to Irian Jaya (western New Guinea).

– The Portuguese language has continued to decline in importance in the eastern half of the globe, with the loss of the Portuguese colony of East Timor and the gradual disappearance of Portuguese-based creoles. Portuguese is still used as an administrative and educational language in Portugal's former African colonies, although English and French have become more important as languages of communication with the outside world, especially with neighbouring states. As a transatlantic language, however, Portuguese appears to have a permanent role to play as the national language of both Brazil and Portugal.

– The Russian language benefited from the allied victory in the Second World War, and from the ensuing Cold War, in the extension of its sphere of influence from the Soviet Union to its political satellites, especially in Eastern Europe, where it was generally a compulsory subject in schools. The sealing-off of an important part of the world dominated by the Russian language was continued in the form of the notorious Iron Curtain, a barrier to international communication, which was eventually undermined by the telecommunications revolution.

– The Spanish language has become more limited in its worldwide spread as the result of its dwindling historical influence in the Pacific (the Philippines) and in north-west Africa (Morocco and the eastern Sahara). It has, however, strengthened its position as the most widespread language in the Americas with the growth of the Spanish-speaking minority in the United States, following immigration from Mexico, Cuba, Puerto Rico and elsewhere.

– The Swahili language has gained in importance since the independence of colonial Africa and is the only African language south of the Sahara that has such international extension. Formerly encouraged by the German and the British administrations as a vehicular language in East Africa, Swahili is now the official language of the United Republic of Tanzania and is used also to a lesser extent, but with local variations, in

Kenya, Uganda, Rwanda, Burundi, eastern Zaire, northern Mozambique and the Comoro Islands. It should be noted that Swahili is a Bantu language very heavily influenced by loanwords from Arabic, in the same way that another international language, English, has been very heavily influenced by loanwords from French.

## THE GEOLINGUISTIC CONSEQUENCES OF THE END OF THE COLD WAR

From 1946 to 1989, the Iron Curtain in Europe represented a major barrier to international communication and understanding, its removal being symbolized by the opening of the Berlin Wall in November 1989. The period from 1990 can thus be regarded as a new era of international communication, in which individuals can now converse freely and instantaneously between any two parts of the world.

Since the ending of the Cold War, specific international languages have been affected in the following ways:
– The worldwide spread of the English language has been reinforced by the collapse of the Soviet Union, and English has enjoyed increased study and use as a foreign language in the countries of the former Soviet bloc. The rapid worldwide growth of information technology (IT), including the Internet, has also favoured the use of English as the world's principal vehicular language.
– The German language has also gained in strength and international acceptability from the reunification of Germany and from the renewed use of German as a vehicular language in parts of Eastern Europe.
– The Russian language is still widely used within and among the former states of the Soviet Union, outside Russia itself, and increased contact between Russia and the West has led to a growth in interest in Russian as a foreign language. It has been largely eclipsed, however, in the educational systems of the former Soviet satellites of Eastern Europe, including the Baltic States.
– The Turkish language has benefited from the opening up of frontiers between peoples speaking closely related and largely inter-intelligible Turkic languages – in Turkey itself, and in Azerbaijan, Kazakhstan, Turkmenistan, Uzbekistan and Kirgyzstan, as well as in adjacent areas of Russia and even north-western China.

The use of information technology has been accelerating rapidly since 1990, including the development of the Internet and World Wide Web, and it is evident that the forerunners of this technology (radio, television, telephone, fax, video-recording, etc.) constituted a major element in fomenting political revolution in the Soviet Union and among its allies. Since Hitler's manipulation of radio communication in the 1930s, it has become increasingly difficult for governments to prevent the flow of information through their national frontiers, and this has marked an important, irreversible stage in the general evolution of human communication and political government.

Just as languages should not be confused with peoples and cultures, so international languages should not be confused with their countries of origin. At the end of the twentieth century, international languages are at the disposal of any person who wishes to communicate with another part of the world.

## CONCLUSION

The twentieth century has witnessed the rapid progression of the telecommunications revolution, from the manual telephone to electronic mail, and the increasing integration of all the products of that revolution: instant long-distant communication, computerization and word processing, recording and transmission of sound and image. The human voice has been liberated for the first time from the constraints of time and space, and the spoken word can now compete in international communication with its derivative, the written word. Writing has also undergone a radical development, the rigid framework of the page having evolved towards the fluid medium of the screen, and the printing machine having become a common part of the domestic and business scene.

Although all languages benefit potentially from the effects of the telecommunications revolution, it is inevitable that the establishment of more effective and more rapid communication among the peoples and nations of the world will favour the development and wider use of English and a few other international languages over that of more localized languages. This development has aroused fears for the future, not only of less widely used languages, but also of ethnic and national cultures, which risk being diluted or changed through the open doors of wider international communication.

The domination of the world by mainly European colonial powers until the end of the Second World War is reflected linguistically by the continued domination of international communication by languages originating in Europe. Of all the international languages discussed above, over half are members of the same Indo-European language family, including eight European languages plus Hindi and Urdu in Asia. No less than four European languages (English, French, Russian and Spanish) are included among the six official languages of the UN.

The eight European languages that have enjoyed an international role during the twentieth century have all been associated with European and modern American cultures, although they are not synonymous with those cultures. The strongest of those cultures is that associated jointly with the English and French languages, which have often served to represent two facets of the same internationalized 'Western' culture: English as a favoured vehicle for its more popular manifestations (sports, fast-foods and beer, popular music) and French as the traditional vehicle for its more elitist aspects (haute cuisine, vintage wines and champagne, fashions and perfumes). Both languages have served as vehicles for the spread of Western-style political culture.

It is perhaps not surprising that the most vigorous opposition to the spread of international languages has come from speakers of other widely used languages, whose position in the world is perceived as threatened by the advance of their rivals. The strongest reaction against the worldwide spread of English has thus come from the francophone (French-speaking) community of nations, especially from France itself and Quebec. Both these countries have passed legislation to protect the French language against the increasing influence of English within their own borders: France from 1975 (Bas-Lauriol law) and Quebec from 1977 (charte de la langue française). At the time of writing (1996), the latest legislation on this

subject in Paris has been designed to ensure that a certain percentage of vocal music broadcast within France is in the French language.

From the purely practical point of view, in a multilingual world where communications across national frontiers have been growing at an ever-increasing rate, there has been a manifest need for a universal world language. Early in the twentieth century, there could still be some debate as to whether French or English might best serve such a role, or even an artificial language like Esperanto, but by the end of the century only English has the necessary worldwide spread. Its international usage is gaining momentum as the first foreign language in the majority of national educational systems, and as the now generally accepted language in such vital areas as the control of aviation. Even at a more modest level, it has been found that French and German children, for example, when visiting each other on linguistic exchange-visits, will often converse in English rather than in French or German, since the French children have usually studied more English than German, and vice versa.

On the other hand, localized languages are the means of expressing ethnic and cultural identities, and in certain cases have proved remarkably resistant to pressure from more powerful international languages. A notable example is provided by Welsh, which has been maintained as the mother tongue of a relatively small population (around half a million in the 1990s) on the very island from which English has spread around the world, and only a hundred miles distant from Shakespeare's birthplace in Stratford-on-Avon, the heartland of the English language. Similarly, in France, where a policy of linguistic unity has been pursued for two centuries, a rich variety of local languages – as mentioned above – have survived the pressures of an educational system based exclusively on French.

Among the non-European countries freed from colonial rule since the Second World War, some of the strongest reactions against their former colonial languages came from the multilingual states of India (independent from Great Britain in 1947), Indonesia (independent from the Netherlands in 1949) and the United Republic of Tanzania (independent from Great Britain in 1961).

Although the original constitution of independent India looked forward to the replacement of English by Hindi as the sole official language for the whole country, opposition from speakers of other languages led to the abandoning of this objective in 1967. English, still only spoken by a minority of the population of India, remains nevertheless the most widespread vehicular language throughout that country. In the case of Indonesian and Swahili, established as official languages to replace Dutch in Indonesia and English in Tanzania, respectively, the situation was different in that neither of these vehicular languages represented a dominant ethnic and cultural group within the country, in contrast to Hindi in India. Although there has been some internal opposition to the imposition of each of these two national languages since independence, their use has presented less of an ethnic and cultural problem than in India. In all three cases, English has retained an important role, especially for communication with the outside world.

Throughout the twentieth century, it has been generally accepted that the language in the world with the greatest number of speakers is Chinese (Mandarin), concentrated in central and eastern Asia. With the increasing study and use of English as a second language throughout the world, however, it appears probable that the total number of speakers of that international language will have exceeded even those of Chinese (Mandarin) by the end of the twentieth century, and will have reached a billion individuals (one thousand million) early in the next century.

In the context of the expansion of English and other international languages during this century, much has been written and broadcast about the numerous 'smaller' languages presently in danger of extinction throughout the world, although it is important that this danger should not obscure attention to the much more sombre reality of the extinction of actual peoples, as has occurred this century in several parts of the world. In the case of speakers whose own physical existence is not threatened, the will to preserve their language can only come from within their own community, and it is encouraging that so many small language communities have succeeded in preserving their own linguistic heritage during the twentieth century, in all continents. They deserve every possible support.

The telecommunications revolution has changed traditional relationships among countries and individuals, and has provided the means for new solidarities across the face of the globe. While international languages can now be beamed to worldwide audiences, videotapes and local stations can also be used to link separated communities of speakers of scattered languages, and to serve the needs of speakers of isolated languages.

## NOTE

1.    For the use of the term *logosphere* in English, see entry 'Languages' in *Encyclopedia of the Future*, Macmillan, New York, 1995; for *logosphère* in French, see entry 'Francophonie' in *Livre de l'Année* 1994, Larousse, Paris, 1995

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# 29.6

## HUMAN MOBILITY, CULTURAL INTERACTION AND TOURISM

*Miquel de Moragas* and *Carles Tudurí*

### INTRODUCTION

Tourism – voluntary human movement for cultural purposes, chiefly of a recreational nature – has become one of the social phenomena most representative of the transformation taking place at the end of the twentieth century. In 1950, the number of people who had made international journeys was put at about 25 million. In the closing years of the century, the number was calculated at 700 million.

The World Tourism Organization (WTO) estimates that tourism involves 3.5 per cent of the world's population and that this figure may rise to 7 per cent in the next 10 years.[1]

The phenomenon is thus a large-scale one, but not really universal or broadly based. Almost all travellers are citizens of the wealthiest and most developed countries on the planet. It is significant that these figures – these limitations – are almost identical to the estimates for future Internet penetration in the world, the forecast being that 5 per cent of the world's population will have access to this technology by 2005.

Travel and tourism involve a variety of essential factors in today's society: cultural factors (identity, heritage, education, communication), economic factors (balance of payments, new types of business, the labour market, the indirect development of industrial sectors), political factors (diplomacy, public assistance, planning, cooperation among sectors) and other very important factors such as transport, telecommunication networks and environmental protection.

### A TYPOLOGY OF TRAVEL AND TOURISM IN TODAY'S SOCIETY

Leaving aside remoter historical precedents, which in Europe go back to the earliest voyages of the Greeks and Romans or the pilgrimages of the high Middle Ages, mass tourism began to emerge only with the development of modern communications in the nineteenth century, and was consolidated only after the Second World War.

The motives leading people to travel as tourists have evolved to create a situation whose typology is now very diverse, with variables that include the duration, distance, form of transport, social group or social and cultural objectives of the journey. WTO divides the reasons for travelling into the following types: leisure, recreation and holidaymaking; visits to relatives and friends; business and professional; medical treatment; religion and pilgrimages; other.

If we confine ourselves strictly to tourism and the criteria that guide the tourist industry in the provision of services, we might use the following, rather more detailed typology for the main categories.

*Sun and sand:* This is the leading tourist segment, and the one that was almost wholly responsible for consolidating mass tourism, as the large volume of customers served gave the industry the opportunity to apply economies of scale. As costs fell, tourism as a form of leisure came to involve large sections of society in the developed countries.

*Ecotourism:* A rapidly growing sector, based on visits to high-value natural areas, adventure travel, and wildlife observation. It is mainly carried out in Latin America and Africa. Annual turnover is put at US\$335 million, which represents almost 10 per cent of total tourism turnover.[2] So-called rural tourism could be included in this category.

*Cultural tourism:* This includes a wide range of pursuits: art, music, theatre, ethnology, archaeology, gastronomy. It is often a supplement to tourism of some other kind, such as sun and sand or conferences, which many destinations try to incorporate into their main attractions.

*Conferences, conventions and incentive travel:* A strongly growing sector. Although usually included in the business travel category, gatherings of this type, especially in the case of incentive trips, involve the kind of sightseeing and tourist activities that individual business travellers do not habitually carry out.

*Senior travel:* As older people in the more developed societies have broadened and altered their habits and customs, a segment has been created that is of great interest to the tourist industry, since in many cases their activities can be transferred to the low season. In some European countries, such as Spain, there are subsidized programmes designed in part to enable older people to travel within their own country.

*Sports tourism:* The main purpose of travel is to carry out a particular sporting activity, such as golf, skiing, cycling, water sports, hunting and fishing, adventure sports, tennis, etc. In these cases people travel in search of the best facilities and a suitable climate for the activity concerned.

*Religious travel:* The largest movements are the great pilgrimages to Rome and Santiago de Compostela, in the case of Christians, and to Mecca, in the case of Muslims, although this category also includes visits to other sacred places such as the Holy Land in Israel and sites where miracles are believed to have occurred, such as Lourdes. Rome expects to receive about 20 million visitors for the 'holy year' in 2000.

*Cruises:* This segment dates back almost to the earliest days of tourism, but was not popularized until a few years ago, when costs and prices came down. The route between Alaska and the Caribbean, the Mediterranean and northern Europe are the main areas travelled by cruise liners, some of which are built to carry 3,000 passengers.

*Theme parks:* A form of vacation that is growing very strongly as the century nears its end, the main destination being Orlando in the United States where there are more than 20 major theme parks, including those of Disney and Universal Studios. In addition to traditional parks, which are essentially based on cartoon characters (Disney World, Parc Astérix in France), other types include parks focusing on images and technology (Futuroscope in France), animals (Sea World) and the cinema (Universal Studios). In the United States alone, 300 million people visited an amusement park in 1998.[3] Las Vegas, a destination that could be regarded as one huge theme park, received a total of 30.6 million visitors in 1998, over 13 per cent of them international tourists.[4]

*Celebratory travel:* This category can be used to describe journeys that are carried out to celebrate special occasions and that, consequently, no individual would make more than a few times. They might include honeymoons, anniversaries and study trips, each of which has its own special features.

*Attendance at major events:* Universal exhibitions, the Olympic Games, football world cups are major events which not only attract a large number of visitors, but which establish values and rationales for promoting the places hosting them as major tourist destinations.

*Other forms:* There are many other forms of tourism that are hard to classify. Sex tourism, for example, is something that has a particular impact on certain countries, although obviously it is not promoted as such; quite the opposite, in fact, as there are numerous organizations seeking to eradicate it. At the other extreme is solidarity tourism, with some NGOs organizing stays in Third World countries to promote interaction between cultures. Looking perhaps overconfidently ahead, it is even possible to make bookings for space tourism, and there is a Bureau of Atomic Tourism,[5] which organizes visits to places affected by nuclear explosions. There are also companies that arrange 'reality tours', including visits to ravaged or polluted places, prisons, etc.

**Main trends**

As the industry and its customers mature, some very substantial changes are taking place in the tourism sector. For example, the reasons for travelling are no longer mutually exclusive, as people are not looking to satisfy just a single desire. A tourist booking a journey to a particular area may be looking primarily for sun and sand, for example, but may be interested in the cultural or ecotourism opportunities that the destination also provides. The trend of demand is determining the versatility of supply. All this means that one of the main strategies now being followed by destinations is to diversify supply, both to attract new customers and to keep existing ones.

Destinations are also striving to extend the tourist season so that visitors are spread more evenly throughout the year and infrastructure use is maximized. Another key trend is for holidays to be broken up into a number of shorter trips. This is boosting activities like short city breaks and brief visits to carry out some particular activity (skiing, golf, hunting, shopping). Lastly, it is becoming more and more common for business and leisure activities (art, sport, gastronomy) to be combined in a single journey.

## TOURISM AT THE TURN OF THE CENTURY: PRINCIPAL MOVEMENTS

In quantitative terms, tourism surpassed migration as the main driving force of human movement at the end of the twentieth century. However, as of 1999, it was estimated that there were 120 million emigrants in the world, or more than 2.5 per cent of the world's population and 4.5 per cent of that of the developed countries. Between 1990 and 1995, the developed countries received net migration of about 10.9 million people. During those same five years, Europe received 1.1 million immigrants a year and North America about 960,000, while between 1995 and 2000 the annual figure was expected to be 989,000 in the case of Europe and 930,000 in that of North America.[6] In 1998 the number of tourist journeys was 625 million, with annual growth of about 5 per cent over the last decade. As Table 25 shows, the growth of the sector in the last 45 years has been quite spectacular, with the number of 'arrivals' increasing from 25.3 million in 1950 to 625 million in 1998. This represents growth of 2,470 per cent, or a 24-fold increase over those years. Figures issued by the World Tourism Organization (WTO) showed that international tourism in 2000 grew by 45 million arrivals. Several Mediterranean countries and new destinations like Turkey, Croatia and Bulgaria were especially successful. China showed strong growth in 2002 of more than 10 per cent. The WTO also projected a record 60 million international visitors would come to the USA in 2006, a 32 per cent increase over 2001.

The economic dimension of this phenomenon and the revenue generated by it have, if anything, grown even more strongly, with turnover rising from US$2.1 billion in 1950 to US$445 billion in 1998, an increase of 21,190 per cent. These data do not include domestic tourism, that undertaken by travellers within their own countries, which is calculated to exceed international tourism by a factor of 10. The World Travel and Tourism Council (WTTC) estimates that tourism and related activities generated US$3.5 trillion worldwide in 1999. In Europe in 2003, the European Travel Commission estimated that tourism and related revenues amounted to 249 billion euros for that year alone.

The opportunity to create wealth without the need for major infrastructure, and the growth in purchasing power and free time among certain sections of society, have meant that tourist numbers are continuing to rise, albeit to a more moderate degree than in previous decades. In addition, the countries of the so-called Third World are featuring more and more prominently as both recipients and sources of tourism.

### Destinations and countries of origin

Thus, in 1998 Europe received a total of 372.5 million tourists, or 59.6 per cent of the world total. The American continent was in second place with 120.2 million (19.2 per cent of the total), and East Asia and the Pacific were third with 86.9 million (13.9 per cent). The remaining regions of the world were a long way behind, with Africa receiving 24.9 million tourists (4 per cent), the Middle East 15.6 million (2.5 per cent) and South Asia 5.1 million (0.8 per cent).

*Table 25* **International tourist arrivals and revenue worldwide, 1950–1998** *(expressed in millions of visitors and US dollars)*

| Year | Arrivals | Visitor Index (1950=100) (*) | Revenue | Revenue Index (1950=100) (**) |
|------|----------|---------|---------|---------|
| 1950 | 25.3 | 100 | 2,100 | 100 |
| 1960 | 69.3 | 274 | 6,867 | 327 |
| 1970 | 165.7 | 656 | 17,900 | 800 |
| 1980 | 286.2 | 1,132 | 105,198 | 5,009 |
| 1990 | 459.2 | 1,816 | 264,714 | 10,398 |
| 1995 | 561.0 | 2,218 | 380,693 | 18,128 |
| 1998 | 625.0 | 2,470 | 445,000 | 21,190 |

\* Excluding day trips.

\*\* Excluding transport costs.

*Source:* WTO.

The great majority of the main tourist destinations are developed countries. The variety of tourist activity is reflected in the diversity of supply among the three leading countries. Much of what France offers tourists is based on culture and the attraction of its capital (Paris), which receives some 14.2 million international tourists and 10.2 million domestic ones each year. A large proportion of visitors to Spain are still attracted by the country's extensive sun and sand tourist infrastructure, despite efforts to diversify by offering culture and sports as tourist attractions. The Balearic and Canary Islands, for example, received 16 million tourists between them in 1998, as against the 3 million or so visiting Madrid. The United States owes its potential to its great diversity of attractions, among them its main cities. New York, for instance, received 33 million visitors in 1997, 6.1 million of them foreign and 26.9 million domestic. Los Angeles received 23.5 million visitors in the same year, 5.8 million of whom were international, while Florida, which is home to Orlando, a city with numerous theme parks, received 37.2 million visitors in 1997, 3.5 million of them from abroad.

As regards the countries supplying the largest numbers of international tourists, Table 26 shows that the first places are all taken by the members of the G-7, the group of the world's richest countries.[7] These seven countries account for 53.6 per cent of all tourist spending in the world, while receiving 41.8 per cent of all revenues. This means that the tourism balance of payments and income is negative in the developed countries (by about US$58 billion in 1997), while in the less developed economies it is highly positive (US$62.156 billion in 1997). The case of Mexico is one of the most striking, as in 1997 the country's tourism trade balance was in surplus by US$3.701 billion, with revenue of US$7.593 billion being only partially offset by outgoings of

*Table 26* **Spending on international tourism by country**

| Country | Expenditure* 1997 | % Change 1996 -1997 | % of Total Expenditures 1997 |
|---------|---------|---------|---------|
| United States | 51,220 | 5.6 | 13.6 |
| Germany | 46,200 | −9.4 | 12.2 |
| Japan | 33,041 | −10.8 | 8.7 |
| United Kingdom | 27,710 | 9.5 | 7.3 |
| Italy | 16,631 | 5.2 | 4.4 |
| France | 16,576 | −6.6 | 4.4 |
| Canada | 11,304 | 1.9 | 3.0 |
| Austria | 10,992 | −6.9 | 2.9 |
| Netherlands | 10,232 | −11.5 | 2.7 |
| China | 10,166 | 127.2 | 2.7 |
| Russian Fed. | 10,113 | −1.5 | 2.7 |
| Belgium | 8,275 | −11.3 | 2.2 |
| Switzerland | 6,904 | −8.8 | 2.2 |
| Poland | 6,900 | 10.6 | 1.8 |
| Brazil | 6,583 | 13.0 | 1.7 |

*Expressed in millions of US dollars, excluding transport

*Source:* WTO.

US$3.89 billion. In Cuba, revenue in that same year was US$1.35 billion, a sum that can largely be set down as a surplus, since the number of people travelling abroad from the country is very small.[8]

Consequently, tourism is of vital importance to poor countries, particularly in certain cases such as those of Cuba, the Dominican Republic and Jamaica, where it generates a large proportion of national income. This importance is increasing by the year, since less economically developed regions (such as Africa, the Middle East and Asia) are seeing faster tourism growth than the developed countries.

Over the last 10 years (1989–98), the number of visitors to the Middle East and the East Asia and Pacific area has grown at a rate of 6.9 per cent a year. In the case of Africa the figure is 6.8 per cent a year, and in that of South Asia it is 5.9 per cent a year. By contrast, Europe has grown by only 3.8 per cent a year and the American continent by 3.7 per cent.

**Forecasts**

WTO itself expects that by 2010 the European share of international arrivals will have fallen to 50.8 per cent from the 1970 figure of 68.1 per cent, a drop of 17.3 percentage points, while the Asia and the Pacific region will have increased its share by the same amount, from 3 per cent to 20.3 per cent. Africa will also have achieved an increase of 2.6 points by that same year, with a share of 3.8 per cent.

Thus, WTO predicts that by 2020 China will be the world's leading destination, with 130 million travellers, while Hong Kong will be in fifth place with 56.5 million. In between will be the three leading tourism powers of today: France, the United States and Spain.

Poorer countries will also be contributing more travellers to this international tourist flow, although the numbers will still be relatively small. Thus, in 2020 the main countries of origin will still be the same, except that China will have emerged in fourth place and the Russian Federation will be in tenth place. The contributions of Thailand and Singapore will also increase strikingly. The tourist spending of China rose by 127 per cent in 1997, which took the country from twenty-second place in the ranking to tenth in just one year. The burgeoning of tourism from some other countries with great potential, such as the Russian Federation, is taking longer than the tourism sector itself was anticipating a few years ago, owing in this particular case to the domestic political crises the country is experiencing.

Thus, if expectations about international tourist flows are confirmed, developing countries will be playing an ever more important role in tourism, both as recipients and, above all, as sources of tourism.

## ECONOMIC AND SOCIAL ASPECTS OF TOURISM

One of the most striking aspects of modern tourism is undoubtedly its economic importance and its ability to create jobs. WTO estimates that about 100 million people worldwide are employed in this sector, which accounts for about 10 per cent of world gross domestic product (GDP). Where employment is concerned, jobs are being created 1.5 times faster in the tourist industry than in any other. The tourism sector generated 8 per cent of world exports in 1997, and 30 per cent of service sector exports. The World Travel and Tourism Council (WTTC), which represents the leading companies in the sector, depicts the situation in an even more favourable light, calculating that tourism is responsible for 190 million jobs worldwide, or 8 per cent of total employment, and accounts for 11.7 per cent of GDP. It estimates that the sector will generate 5.5 million jobs a year up to 2010. As regards GDP, the figure put forward is US$3.5 trillion. Also according WTTC figures, 698 million people travelled to a foreign country in 2000, spending more than US$478 billion. International tourism revenues combined with passenger transport accounted for

*Table 27* **Economic impact of tourism (1999)**

| GDP | (% of Total) | Employment | (% of Total) |
|---|---|---|---|
| 1. Caribbean | 20.6 | 1. Oceania | 16.0 |
| 2. Other European countries | 15.4 | 2. Caribbean | 15.8 |
| 3. Oceania | 14.7 | 3. Europe (except EU) | 15.6 |
| 4. European Union | 14.1 | 4. European Union | 14.5 |
| 5. North America | 11.8 | 5. North America | 11.9 |
| 6. Sub-Saharan Africa | 11.2 | 6. Central and Eastern Europe | 11.7 |
| 7. Central and Eastern Europe | 11.1 | 7. North Africa | 7.4 |
| 8. South-East Asia | 10.6 | 8. Sub-Saharan Africa | 7.4 |
| 9. North-East Asia | 10.0 | 9. South-East Asia | 7.3 |
| 10. Middle East | 7.3 | 10. North-East Asia | 7.1 |
| 11. North Africa | 6.8 | 11. Middle East | 6.1 |
| 12. Latin America | 5.6 | 12. Latin America | 6.0 |
| 13. South Asia | 5.3 | 13. South Asia | 5.4 |

*Source:* WTTC.

US$575 billion – making tourism the world's number one export earner, ahead even of automotive products, chemicals, petroleum and food.

In most countries, the work of developing tourism involves different government departments, essentially those responsible for infrastructure, cultural heritage and the environment, although the size of the sector means that this involvement is extending to more and more public and private actors who understand the importance of tourism promotion policies and the value that these can add.

The growing socio-economic importance of tourism resulted in the creation of the World Tourism Organization,[9] which commenced operations in 1975. By 1999, it had a membership of 138 countries and more than 350 affiliate members representing local governments, tourism trade associations and companies in the sector. WTO has been an executive agency of the United Nations Development Programme since 1976, and its primary objective is 'through tourism … to stimulate economic growth and job creation, provide incentives for protecting the environment and cultural heritage, and promote peace, prosperity and respect for human rights'. To this end, it is actively involved in compiling tourism statistics, holding conferences, publishing research and sponsoring specific tourism policy proposals.

## The impact on developed countries

This has led numerous countries and supranational bodies to implement specific tourism policies with a view to stimulating this activity and encouraging its positive effects. The European Union, for example, while it has not elected to set up a specific directorate general for tourism, notwithstanding the importance of the industry to the EU economy, has launched a number of programmes to develop the sector, such as *Philoxenia*, or to create data transmission networks that serve its needs (MINTOUR and *Intourisme*).[10] It has also provided the sector with structural funds that have enabled transport infrastructure and environmental improvement works to be undertaken, with a positive effect on tourism.

Tourism is one of the leading economic sectors in Europe. It is estimated to employ 9 million people directly in the European Union, or 6 per cent of the total workforce, a figure that is expected to rise to 9 per cent over the coming years. As Table 27 shows, WTTC calculates that tourism accounts for 14.1 per cent of GDP and 14.5 per cent of employment in the European Union.[11]

Spain depends more heavily on tourism than any other country in the European Union, with 22.7 per cent of the country's GDP and 24.3 per cent of jobs being generated by the industry, according to WTTC. In exceptionally tourist-oriented regions, such as the Balearic Islands, the service sector, largely catering for tourism, generates 84 per cent of GDP. Thanks to this activity, per capita income in the islands is above the European average, and the unemployment rate is well below the national average.

In the North American continent, the turnover of the tourist industry is also very large, accounting for 11.8 per cent of GDP and 11.9 per cent of employment. In the United States, tourism accounts for 12.1 per cent of GDP and 13.2 per cent of employment, while the figures for Canada are slightly higher, at 13.6 per cent and 14.9 per cent respectively.

Tourism also plays a vital role in Oceania, providing 14.7 per cent of GDP and 16 per cent of employment. The two largest countries in the area, Australia and New Zealand, are major magnets for tourism and their industries account for 13.8 per cent and 16.9 per cent of GDP respectively.

## The impact on developing countries

Tourism is seen as an opportunity to stimulate development in areas that face obstacles to the creation of wealth through the industrial sector. The new jobs and foreign currency that tourism brings, and the opportunities it offers to develop new infrastructure, are the main attractions for these countries.

Developing tourism involves the creation of infrastructure and facilities (airports, highways, sewage systems) that can help to improve living conditions for those who inhabit tourist destinations, although in a good many cases the benefits brought by tourism have not translated into improvements for the local population. Likewise, tourism offers an opportunity to capitalize on existing cultural and natural resources, generating the revenue needed for conservation and improvement work. Programmes to revive places of historical and natural interest, such as the designation of World Heritage sites by UNESCO, have helped reinvigorate many cities in the Third World that have found ways of generating revenue from tourism.

The Caribbean is an example of tourism's importance, since in this region tourism generates as much as 20.6 per cent of GDP and 15.8 per cent of employment. In the smaller tourist islands (Aruba, Bahamas, Barbados, the Cayman Islands), tourism accounts for more than 50 per cent of GDP and similar percentages of employment. Even in the larger islands, tourism is hardly less important to national economies. The shares of GDP and employment it accounts for are, respectively, 14.9 per cent and 13.2 per cent in Cuba, 22.1 per cent and 19 per cent in the Dominican Republic and 35.7 per cent and 28.2 per cent in Jamaica.[12]

The ease with which some resources can be exploited for tourism purposes (beaches, natural areas, cultural attractions), compared to the greater difficulties usually entailed by industrial development, is stimulating the development of this activity in Third World countries. In many cases, however, it is left to foreign investors from richer countries to create facilities for travellers, and it is their large hotel chains that usually take the lead in fostering tourism in these places. Spanish hotel chains, for example, play a vital role in tourism operations in certain areas of the Caribbean (Dominican Republic, Cuba and the Maya Riviera in Mexico), investing heavily in the construction of large luxury tourism complexes. Companies from the United States and other powers have also played a very large role in the development of the hotel trade, in both cities and holiday resorts. There are cases, therefore, where the development of tourism has not resulted in major improvements for the local population, since local private companies and public authorities have played only a very small role in such growth.

One result of all this has been the creation of luxury tourist ghettos in very poor regions. Striking examples of such places, from which the local population is virtually debarred except when it is called upon to provide labour, are

to be found in the three countries mentioned above, and in many other countries of the Caribbean and the Third World. Varadero in Cuba, Playa Bávaro and Puerto Plata in the Dominican Republic and Playa del Carmen in Mexico are a few examples. In these areas, furthermore, tourist complexes market an 'all inclusive' system, which means that tourists virtually never leave their hotels throughout their stay, or do so only to go on planned excursions.

## The adverse effects of tourism

Despite everything that has been said, the development of tourism is not without its costs. Tourism can make severe demands on land, so that uncontrolled development may result in very adverse effects on the area where it takes place, leading to irreversible changes in the environment and landscape.

Thus, for example, much of the Mediterranean coastline has sustained this kind of impact, and it has been most substantial in those areas that were the first to develop, such as certain parts of the Côte d'Azur, the Balearics, the Costa Brava, the Costa del Sol, and the Italian Riviera, where tons of concrete in the form of hotels have transformed the shoreline. Acapulco, Miami, Rio de Janeiro and many other places on the American continent have also sustained a very serious impact on their landscapes. At present, the development of the Maya Riviera in Mexico, stretching from Cancún almost to Belize, is also attracting strong criticism from environmental groups because of its impact on a natural area of outstanding value.

Furthermore, when millions of people visit certain natural and cultural attractions, the effects may be the opposite of what the exploitation of these resources was originally intended to achieve, such as conservation and improvement. The crowds visiting the Maya and Aztec pyramids of Mexico have caused them damage, for example, while excursions to view dolphins, whales or the hatching of particular animals can also have a negative influence on certain ecosystems.

These negative consequences have given rise to the concept of 'sustainable tourism', the aim of which is to harmonize tourism with its surroundings. Tourism has thus been included in the Agenda 21 programme[13] as one of the few industries capable of creating an economic incentive for environmental conservation, provided that it is managed with a view to sustainable development.

## INFORMATION AND COMMUNICATION

Tourism is inseparable from information and communication. The whole industry is ultimately based on the psychological motivations that lead people to travel, to look beyond the home for whatever they have begun to imagine in their own surroundings. The motivations for tourism arise out of information and would be inexplicable if various cultural factors were not taken into consideration: education, the media, the tourism industry itself and its use of advertising and promotion.

The tourism-culture-communication nexus has not aroused the academic interest it deserves, however. By way of introduction, we shall make some observations here on the many fields of interest that arise from these interconnections.

## Travel books and tourist guides

Travel has captured the imagination of writers since earliest times. Numerous authors have given the best of themselves to travel writing. It is not until travel began to take place on a mass scale, however, that we can properly speak of 'tourist guides'. Little by little, these gained ground in travel literature. Now, at the close of the century, most tourists preparing to visit a country begin their journey in the company of one of the guides produced by the major publishing houses. Let's Go, Michelin, Footprint and Lonely Planet are some of the most popular guide collections, with publications on a large number of tourist destinations.

The main difference between travel books and tourist guides is that the former seek to provide readers with a literary re-creation of a journey, while the latter aim to supply them with a body of useful information to orient their travels. From the reader's point of view, the essential difference lies in the fact that travel books are read for their literary value without there necessarily being any intention to make the journey described, while guides are normally acquired once the decision has been taken to visit the destination they cover.

Books are no longer the only format for travel guides, however. The major tourist destinations now have video guides as well. Furthermore, while there have been travel programmes on television for many years now, the appearance of cable and satellite television has allowed specialist travel channels to appear (*Travel* in the United Kingdom, for example, and *Viajar* in Spain). These broadcast documentaries are cast in the form of travel guides, one example being those of the Lonely Planet production company.

## The promotional image

As the industry sees it, the image of the tourism product is the global perception of tourism opportunities available that is formed in the mind of the potential traveller by a range of information processes.

A large number of communication resources are involved in these processes: the education system, the media, promotional brochures, promotional videos and CD-ROMs, videotext, travel guides, global distribution systems, travel agencies, advertising by tour operators, attendance at fairs, personal contacts, national tourism offices and foreign embassies and, most recently, the Internet. These sources of information can be supplemented at the point of destination by information offices, media, electronic information booths, brochures and personal contacts with guides and tour operators, tourism staff and so on.

The impact and economic importance of tourism have led both the private and public sectors to invest substantially in promotional activities aimed at influencing this process of image formation. Thus, in 1997, national agencies promoting tourism spent a total of US$1.08 billion,[14] a figure that does not include spending by the regional bodies, which in many countries, such as Spain and the United States, carry out the bulk of public promotion work.

This concern to improve the image of destinations is due to the importance of potential travellers' decision-making

processes. Tourism differs from other products in that it cannot be inspected at first hand by the buyer and is a composite of several services provided by companies that are often located in different countries. These promotional images have to compete with all sorts of messages put out by other sources with greater penetration and credibility, such as personal contacts, news and the cinema.

The messages sent out by destinations are not homogeneous, as they can originate from a large number of actors in the tourism process. Thus, at a first level, communication of this kind may originate from the local industry and public-sector promotional agencies. At a second level in the process are industry intermediaries, the travel agencies and tour operators, while at the final level are the communications media, which relay information from all the above actors.

The promotional image is characterized, obviously, by its exclusive focus on the positive aspects of the destination, while the negative aspects can be found, along with the positive ones, in information from independent sources such as news, films, travel books, personal contacts, etc.

As a number of studies have shown,[15] changing the image of a tourist destination is an extraordinarily slow process, despite all the money that may be poured into it. In cases where dramatic, violent events occur, such as terrorist attacks, coups d'état and natural disasters, or where the destination hosts events that receive wide international coverage (Olympic Games, football World Cups, universal exhibitions), change may be quicker, however.[16] In the case of some destinations, such as Florida and Egypt, it has taken years for tourism levels to recover after tourists have been murdered, despite the resources expended in the effort to improve their image. The same thing happened with China after the events in Tiananmen Square.[17]

### The advent of the Internet

The introduction and development of new information technologies has had a major impact on tourist information. These new technologies have been seen by tourist destinations and companies as an opportunity to make direct contact with potential customers more effectively and at lower cost, in a process that has been termed 'disintermediation'.

Thus, the platforms where communication normally takes place in the world of tourism, such as large fairs, have had to share this role with new ones, such as the Internet and data transmission networks applied to tourism.

Printed brochures are under threat from multimedia CD-ROMs, which have certain advantages such as the ability to include sounds and moving images in presentations, something that can enhance the interest of their contents.

As already mentioned, digital satellite and cable television have opened the way for channels specializing in tourism, but also for tour operators selling exclusively their own products on a television channel, one example being TV Travel Shop (United Kingdom). In some countries, teletext is also a very important tourism sales device.

The Internet is unquestionably destined to play a crucial role in tourist organization and information in the future. Already, all the major search engines (Yahoo, Infoseek, AOL, Olé, etc.) include a tourism or travel section on their front pages. Use of the Internet to choose destinations, transport systems, hotels, restaurants and activities will grow over the coming years. This will require a major effort by all tourism actors, as they will need to adapt their current information formats to the new generation of digital communications.

## THE CULTURAL DIMENSION: WORLD DESTINATIONS FOR LOCAL IMAGINATIONS

The cultural dimensions of tourism are to be sought in the values (meanings) that determine the social practices of this phenomenon in the modern world. What are the motives, the stimuli, that impel people to travel to or stay in other places for tourist purposes? Who conditions these values, and how? Where do they originate?

Travel in our time, like mass culture and communication, is very different from what it was in previous eras when what predominated were risk, adventure and rites of passage. The mystique of pilgrimages in the Middle Ages, or the adventure of discovery in modern times, are examples that show how far most of the cultural practices of modern tourism have moved away from those of earlier times.

It is not unusual to find today's tourist advertising campaigns dwelling on concepts like 'getting away', 'leaving it all behind' or 'taking a break'. Increasingly, tourist travel is being promoted as a way of escaping from one's 'own world of work'.[18] Less and less is it seen as a rite of interaction, in the sense of opening up to new cultural experiences. Modern tourism is associated to an ever greater extent with the satisfaction and pleasure of holiday situations. Adventure sports are the exception that confirms the rule.

Globalization (of design, consumption and symbology) has made the same type of commodities available in the farthest flung parts of the world, settings tailored to the tastes and needs of Western travellers that leave very little space for the representation of local differences.

This situation, which has been termed the 'McDonaldization of society',[19] is particularly evident in the case of business travel, which accounts for about 40 per cent of all travellers' movements in the world. Business travellers, like sun and sand travellers, pass through airports, taxis, hotels, restaurants, bars and conference halls that are all designed to the same criteria of comfort and profitability.

As is generally the case with modern culture, this phenomenon needs to be interpreted in the light of the new dialectic between the global and the local.

The culture of the destination is not necessarily the culture that the traveller will encounter upon arrival. Any part of the globe can now be the setting for standard Western tourist culture, or even the traveller's own local culture. Even visits to emblematic places end up being made outside of the context that gave birth to them. Many tourist practices involve a change of physical territory but not of cultural territory. This is the result not just of modern forms of air travel, which seem to destroy any perception of the real distance and route covered, but also of the introduction of a few (Western) standard settings everywhere in the world. Airports, airport corridors, bars, duty-free shops, shopping centres and hotel chains are significant examples of this cosmopolitan continuum that stretches around the globe.

The spread of golf courses, with green fairways and hills in arid zones, is one of the most startling examples of this stage-setting, this transposition not only of symbolic referents but also of social practices from one's own local context to another local context.

This tendency towards globalization and the resulting concealment of the destination's local cultures is being reinforced still further by new communication technologies, and particularly by satellite technology, which enables travellers to carry on connecting to their local television stations from any hotel in the world.

This 'semanticization' of tourism is also being influenced by the process of convergence between the tourist industry and the multinational communication industries. Theme parks such as Disneyland are striking examples of this convergence, where film fiction becomes 'reality fiction'.

Indeed, Walt Disney is no longer just a communication multinational but a tourism multinational as well. Besides its theme parks, it owns hotels, cruise liners and even a 'theme' island, situated in the Bahamas, for its cruise passengers. Universal also has large theme parks, one of them in Orlando. Sony has stated its readiness to make a forceful entry into the world of tourism.

In these circumstances, the place of destination, the accommodation available and the local culture tend to become less relevant, with greater importance being attached to pre-packaged themes or better climate and environmental conditions. Sun and theming, rather than interpersonal communication and interaction with the local culture, seem to be the determining factors in mass tourism consumption at the present time.

This accounts for such emblematic cases as that of the hotels and beaches of Varadero, where it can be said that some travellers go to Cuba 'without passing through Cuba', or that of Mallorca, where a British visitor can eat baked beans on toast for breakfast, stroll along streets full of English signs, enjoy a Manchester-Liverpool football match in the pub and dance to the latest music in a discotheque where the DJ has a London accent.

## Tourism: local referents and cultural interaction

Intercultural analyses[20] reveal how important an individual's own cultural influences are in the interpretation of cultures. These interpretations also account for the behaviour of those who participate in mass tourism today. Consequently, it can be said that the desire to travel originates not just in the destination culture but also, or chiefly, in the culture of origin.

The typology of tourism given earlier sets out differences in the referents sought by travellers (third age tourism, holidaymaking, business travel, youth tourism), but all these referents can be resolved into a limited number of patterns.

The desire to travel arises out of some type of 'dream' constructed by the cultural apparatus of each society: education, religion, media (cinema, television, celebrity magazines), promotional campaigns, etc. But these dreams are increasingly being induced by promotional strategies designed to benefit the major tourist circuits.

Historical and cultural referents remain important as motives for travel. But 'experiences' are what are essential. The traveller cannot leave Rome without 'doing' the Sistine Chapel, or Barcelona without standing in front of Gaudí's buildings, or Paris without visiting the Louvre.

Tourists are interested most especially in experiencing the sensation (the ritual?) of having been in the emblematic places of the world: the Trevi Fountain, Sugar Loaf Mountain, the Eiffel Tower, the Empire State Building, the Berlin Wall, the Tower of London, the Plaza de Mayo, the Bridge of Sighs, Lenin's tomb, the Sagrada Familia, the Pyramids. These places are of different types, some being artistic or historical in nature while others are urban landmarks, and they differ greatly in their meaning and artistic value. What they do have in common, however, is the symbolic value of identification with a different and exceptional place. These are fleeting visits, but they are enough to provide the background for a family photograph, to construct the memory 'of having been there' which is perpetuated, finally, through the purchase of 'souvenirs' of some kind, authentic expressions of kitsch.

Tourist guides mark these great sites with multiple stars. But these stars are now shared with other, less historic referents from the cinema, television, celebrity magazines or more recent literary traditions. As an anecdotal example, we may mention the case of a bar in Madrid where the following humorous notice can be read: 'Hemingway never came to this bar'.

The scheduling of travel at holiday times and the new cultural forms of leisure in more developed societies, combined with the cult of the body, have lent increasing importance to another of the great referents of the tourist dream: the climatic and environmental referent, chiefly sun and sand, the culture of heat and skin pigmentation. It is true that these referents are combined with historical or artistic ones, but it is no less true that in many instances they are the only value or referent for tourism that is conducted thousands of miles from home and is virtually bereft of contact with the indigenous population and its culture.

## National images for tourists

Because of all these factors, the production of symbols to represent cities, countries and regions in the world tourism market has taken on greater and greater importance.

The aim of these campaigns has to be to attract visitors, appealing to their imagination without violating the image of the indigenous populations themselves. All kinds of conflicts and discrepancies arise between the tourist image that is projected for each country and its actual image, whether it is the personality of its inhabitants, the characteristics of its townscape or its natural features that are involved.

This production and selection of symbols to identify tourist destinations has become one of the great issues of modern cultural policies, owing to the numerous symbolic and economic implications it entails.

Modern tourism determines a country's image in terms of what it has to offer tourists, forcing it to adapt its identifying features to the conditions of its tourist market, so that certain aspects are given priority over others. This is the case with Australia and its relationship with Japan, or the European Union in the way internal tourism is promoted, or Mexico in relation to visitors from the United States.

## Opportunities and difficulties for intercultural dialogue

Tourism, therefore, represents a great array of risks and opportunities, and is a primary focus of the new cultural policies. The way ahead must be to strengthen the agents of cultural permeability between visitors and visited (services, taxi drivers, hoteliers, shopkeepers, musicians) and to avoid unsustainable tourism models, represented by the walls of the new tourist ghettos whose basis is the exploitation of territory without any beneficial interaction among all the different parties involved.

Above all, this great mass phenomenon needs to be harnessed for the promotion of interculturality. This will unquestionably mean drawing on all the potential of the cultural heritage, which, as UNESCO has observed on various occasions,[21] constitutes the main cultural dimension of tourism.

Furthermore, tourism policies and the resources that can be generated through them should allow the poorest countries to create their own cultural policies and defend their heritage. The process of convergence between culture and tourism should not be left solely in the hands of the large multinationals referred to here, but should become one of the priority objectives of modern cultural policies.

## NOTES

1.  WTO, 'Megatrends of Tourism in Europe to the Year 2005 and Beyond'. Data supplied to the authors by WTO.
2.  'The adventurous journey towards sustainability', in *The Green Money Journal*, Fall/Winter 1995.
3.  International Association of Amusement Parks and Attractions, www.iaapa.org.
4.  Las Vegas Convention and Visitors Authority, www.lasvegas24hours.com.
5.  The Bureau of Atomic Tourism, www.oz.net/~chrisp/atomic.html.
6.  Report of the Secretary General, Commission on Population and Development, Economic and Social Council, United Nations, March 1999.
7.  The G-7 is composed of the United States, Germany, Japan, the United Kingdom, Italy, France and Canada.
8.  Data supplied to the authors by WTO.
9.  WTO arose out of a reorganization of the International Union of Official Travel Organizations, created in 1947, whose members agreed in 1970 to found the new body. See http://www.world-tourism.org.
10. MINTOUR is a public service consisting of a network of multimedia information servers that provides private-sector industry, travellers and public-sector agencies with information on the European tourism sector. The Intourisme project pursues similar objectives through the World Wide Web, and is promoted by Directorates General XIII and XVI of the European Union (http://europa.eu.int).
11. The figures provided by WTTC consider both the direct and indirect impact of tourism on the economy so that they include, for example, hotel construction.
12. WTTC data (http://wttc.org).
13. Agenda 21 is the programme of action agreed upon at the Environment Summit held in Rio de Janeiro in 1992 to promote sustainable development.

14. Data supplied to the authors by WTO.
15. W. Gartner and J. D. Hunt, 'An analysis of state image change over a twelve-year period (1971–1983)', in *Journal of Travel Research*, Vol. 26, No. 2, 1987, pp. 15–19.
16. For the case of Barcelona in 1992, see M. De Moragas and M. Botella (eds.), *The Keys to Success*, Barcelona, 1995.
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## THE INDIVIDUAL AND INFORMATION TECHNOLOGIES

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## INTRODUCTION

In the Northern industrial democracies, the prevailing wisdom is that the principles laid down in declarations of human rights and individual constitutions are based on the dignity of the individual. The latter is the be-all and end-all of political theory. Historically, the individual is the result of the emancipation of the bourgeoisie from the feudal order – through the Renaissance in Italy, the Protestant Reformation in Germany, and the 1789 Revolution in France. In the eighteenth century, political philosophy discovered the self, which possesses autonomy, uniqueness, and dignity. Against this background, the individual is conceived of as an independent being, capable of reason and will. Linked to the concept of the individual is that of privacy. This Latinate word appears in German for the first time in the sixteenth century, in the age of Luther, and specifically refers to that sphere of life which is divided off from the state. In these countries, the prevailing wisdom is that the individual's private sphere is to be protected from interference by the state. This is the main idea behind both George Orwell's *Nineteen Eighty-Four* (1949), with its omnipresent Big Brother, and the many data protection laws that have been passed since the beginning of the 1970s.

The degree to which the concepts of the individual and of privacy are presently undergoing a historical change is made clear by the French cultural historian Philippe Ariès in his work *Histoire de la Vie Privée* (1985–87): the term 'individualism' appeared in Europe only as late as 1850. Following the work of the German sociologist Max Weber, the historical growth in individualism is synonymous with the process of modernization and civilization. On the one side of the dichotomy between traditionality and rationalization stand concepts such as family, stability, low political participation and inward orientation, while on the other, that of modernity, stand concepts such as individual, mobility, high political participation and outward orientation. At the present time in Europe, the tradition of the Weberian modernization theory is represented by the English social scientist Antony Giddens and by the German sociologist Ulrich Beck.

A political philosophy that places the individual at the centre of its deliberations finds itself the target of criticism from a number of directions: (1) All schools of contemporary sociology start out from the premise that the individual, in the social sense of the term, can only realize the specific expression of its genetic potential as a social being – as a personality – through society; (2) empirically it is debatable whether increasing modernization entails increasing individualization; it is conceivable that an empirically determined increase in individualization is simply based on selective perception and self-fulfilling prophesies on the part of the researchers; (3) from a normative perspective too, it is debatable whether an increase in individualization is desirable, since such a development could lead to the so-called hedonism trap.

But the gravest objection is that a political philosophy based on the individual is Eurocentric, both de facto and from a normative point of view. Neither ancient Greece nor Islamic law, neither the cosmic philosophies of India, nor Japanese and Chinese ethics, recognize individual entitlement under law. Rather, the individual is recognized not as an autonomous being but as a member of the community, and only as such does the individual enjoy political rights. In the human rights debate, this has led to the Universal Declaration of Human Rights (1948) being augmented by social rights, through the two pacts of 1966, the one on civil and political rights and the other on economic, social and cultural rights. The Vienna Human Rights Conference of 1993 also recognizes the coexistence of individual and social rights.

The German social philosopher Theodor W. Adorno has insisted on maintaining the vision that individual freedom be the highest norm worth striving for. Yet with equal emphasis he has insisted that the consumerist character of capitalism destroys all individuality and that under capitalist conditions there can be no free unfolding of individual potential.

All developments in information technology and the mass media which touch on the dignity of the individual must be considered within this area of conflict between individual, society and state.

## PRIVACY

Data protection raises the problem as to the conditions under which society's conduct in the information field can be made acceptable to the members of that society. Whereas this problem was first recognized as being socially relevant under eighteenth century absolutism, it is the ancient legal

institutions of a priest's duty to remain silent and medical confidentiality that may serve as the historically most important precedents for the current debate on electronic data processing and privacy. In the field of medicine the Hippocratic oath (named after the Greek doctor Hippocrates, 460–377 BC) includes the rule of medical confidentiality. In the history of the Church, the seal of confession became important as the Church went over to receiving confessions of non-public sins in private. Historically, this change can be dated by a decree of Charles the Great in the early ninth century. A definitive regulation in canonical law took place at the Lateran Council of 1215, at which life-long imprisonment was decreed for violation of the seal of confession. During the Spanish Inquisition, in the thirteenth century, the debate between theologians and canonical lawyers over the seal of confession came to a crisis because the problem arose as to whether the seal of confession applied to heretics too.

In this area of conflict between silence and speech, between secrecy and transparency, between privacy and openness, historical precedents for the current debate on data protection may be seen not only in protective laws but also in basic principles concerning what is public information. In this respect mention must be made of the first Swedish press law of 1766, which for the first time both admitted and regulated access to public documents.

In most industrial countries, the data protection laws that have existed since the early 1970s are to be understood as a reaction to technology, specifically to electronic data processing. This is by no means a natural consequence. For instance, the data protection laws passed in Hungary in the early 1980s were not a reaction to technology but the expression of a political struggle to assert legal and civil rights against a centralized one-party state. This fact has, incidentally, led to the creation of something unique to Hungarian law. The country's data protection laws apply not only to natural and legal persons but also to organizations not having a legal personality, i.e. to citizens' action groups and above all to human rights groups, for it is precisely the status of the latter which these laws were designed to protect.

The first data protection law in the world was passed in the German federal state of Hesse in 1971. Together with the German Federal Data Protection Act of 1977, it owes much to the foregoing debate on privacy in the USA. As is the case with the US Privacy Act of 1974, most data protection laws are oriented towards the rights of the individual. They are understood to be a concretization of the national constitution of the country in question, specifying that which in many constitutions is covered by such terms as the free development of personality or the dignity of the individual.

Most data protection laws conform to the following basic principles with respect to the area in which they are operative and are applied:

- The laws regulate only the protection of personal data.
- For the most part, the laws regulate not how such data are handled in general but how their misuse is to be avoided.
- They refer only to electronic data processing and exclude records and collections of records on paper.
- In many laws, the concept of protection is not litigable. Yet what is considered worthy of protection includes in particular data on health, on illegal acts, and on religious and political views.
- The laws regulate data processing by the authorities and by natural and legal persons, thus interfering in a range of social relationships.
- As interpreted by most data protection laws, personal data refer only to natural persons. In some countries, data protection laws also extend to legal persons.

In 1983, the Federal Constitutional Court of the Federal Republic of Germany passed down a decision of general principle on the relationship of data protection to the constitution. For two reasons, this decision is of outstanding significance for the position of the individual vis-à-vis the state. Through this decision, the court created the so-called right of each citizen to informational self-determination. According to this decision, a democratic society can exist only if each citizen knows 'who knows what, when, and under what circumstances about him or her.' In addition, what is new about this decision is its shifting of the burden of proof. It is not the legitimacy of the authority to process personal data, but rather the legitimacy of the authority to make use of such data without, or even against, the permission of those affected, that must now be specifically established.

The whole debate on data protection is, first of all, for the most part a product of the 1970s and early 1980s. Secondly it essentially starts out from a Western European legal and constitutional understanding of the individual and the latter's human dignity. In North America the debate on data protection resulted in the US Privacy Act of 1974 and the Canadian Privacy Act of 1983. Right from the beginning, this debate had less status in North America than it has had in Western Europe. At the end of the 1970s, the US Congressional Privacy Protection Study Commission established that the Privacy Act was de facto meaningless. Kevin G. Wilson advanced a similar argument: in the interests of efficiency and control, government bureaucracies and the commercial interests of the privately owned information industry have overshadowed any legal right to privacy.[1] David Banisar even went so far as to say that the privacy policy of the US Government has, since the seventies, 'fallen into a coma'.[2]

In 1995, the European Parliament and the European Union promulgated a Directive on the protection of individuals with regard to the processing of personal data and on the free movement of such data. This Directive obligates member countries to regulate the collection and transmission of personal data not only within their own states, but also to other member states within the European Union. As such, the Directive sparked an immediate international controversy. The focus of contention was Articles 25 and 26, which regulate the transmission of data to non-member states. This Directive was and is of such great significance because its Article 25 regulates the international information market in a completely new way. According to this Directive, the international transmission of personal data must be restricted in those cases in which the recipient, non-EU country does not have an 'adequate' policy on the privacy rights of the individual, even if this call subverts international trade. Put simply, the EU's position is 'no privacy, no trade'. This position brought a storm of American and Japanese protests down on the EU. Behind this controversy is not simply an apparently obvious conflict between individual rights and international

trade interests. The fact is rather that Europeans see privacy as a human right, whereas Americans see it merely as a civil right.

Most philosophies of data protection have to be seen against the background of technological developments. More precisely, they reflect natural rights concepts concerning the protection of the individual from the Big Brother state – concepts which arose in the 1970s against the background of the kind of mainframe electronic data processing that had been around since the 1950s. Such individual rights to self-protection may have been effective against stand-alone computers, but in the face of online global networks they are increasingly losing any function they had. The following examples illustrate some of the current difficulties in data protection:

- In the Northern industrial countries, video surveillance of public spaces and rooms is increasing at an ever-faster rate. At the end of the 1990s, Great Britain is probably the leader in the video surveillance of cities; a total of 500 urban councils have now installed full video coverage of their streets (Plate 172).
- In Germany at the end of the 1990s, several firms began to photograph all the houses in selected communes and to store these photographs in three-dimensional electronic databases.
- Interactive online networks and infrastructures strengthen the new direct marketing and list broker sectors. By comparing a range of data, it is now possible to identify individuals according to age, estimated income, profession, hobby and interests. Such trends are encouraged by the global growth in personal smart cards. The global market for smart cards was expected to top $4.2 billion in 2002.
- The storing of data obtained from DNA analysis – so-called genetic fingerprinting – in modern criminology, with all the resources of medicine and computer technology at its command, runs the danger of using personality and risk profiles to create a 'transparent individual'.

High-resolution cameras on board surveillance satellites can now achieve a resolution of 1 metre by 1 metre, i.e. a camera positioned in space can recognize a point on earth when it is only 1 metre from the next point. Since the end of the 1990s, one can buy pictures from such surveillance satellites on the open market. The neighbour's garden can be observed from space just as well as a political demonstration, traffic jams, or a close-combat battle in the desert in a future Gulf War.

If one takes a look at Sweden, one notes very clearly that a complex dialectical relationship exists between secrecy and transparency. On the one hand, there can be no other country in the world in which the state has such comprehensive informational access to its citizens, as is the case in Sweden. The system of personal identity numbers created in 1964 accompanies every citizen in every administrative act from the cradle to the grave. But at the same time, Sweden is the one country on earth in which personal data protection is especially intensively cultivated. The increase both in transparent information and in secret information to be kept away from the public eye is characteristic of the general intensification of information, its communication and its exchange. Philippe Ariès has called Sweden a 'transparent' society. In it individual data protection and individual data control are

one and the same: they are an expression of a deeply hedonistic society.

Although almost every country on earth now includes the right to privacy in its constitution, in many places such legal entitlements are more a concession to international norms than they are anchored in the country's culture.

## CENSORSHIP

If one understands by censorship, in general, control over people's opinions backed up by force, then censorship has always existed throughout history. Taking, for instance, the drastic example of book-burning as a specific form of post-censorship, one finds that the first case of such destruction of written documents took place under the Chinese emperor Shi Huangdi in the year 213 BC. (Books on agriculture and medicine were spared from destruction, and furthermore one copy of each text burnt was deposited in the state library of Emperor Shi Huangdi.)

As a controlling means to exclude undesirable publications and to keep the rest in line with state ideology, a pre-censorship has existed in Europe, in the Catholic Church, since 1515. State censorship was established in all European countries at approximately the same time.

In the era of bourgeois emancipation in Europe, when feudal structures were being cast off in the eighteenth and nineteenth centuries, the struggle against censorship and for freedom of speech and the press took top priority. For this reason, the First Amendment to the Constitution was passed in the USA in 1791. To this very day, in Americans' understanding of constitutional priorities, freedom of speech is more important than, for instance, the dignity of the individual, in contrast to many European constitutions. And for this reason Americans' understanding of what is meant by freedom of speech goes much further than in most other countries. For instance the publication of fascist and racist hate literature is just as much protected by the First Amendment as is the public burning of the national flag.

In Great Britain, press censorship was abolished as early as 1694; in France it was swept away by the 1789 Revolution, although Napoleon introduced a press control system, which was extremely similar to censorship. In Germany and Austria, censorship was finally removed in 1848 (although admittedly it was, in the subsequent period of restoration, replaced by such mechanisms as licences, the depositing of securities, and newspaper stamps). During the First World War, censorship was reintroduced in nearly all belligerent countries. Naturally, such censorship measures have existed de facto during wartime throughout the twentieth century, even in the present.

In political philosophy, the question of censorship has been a subject of fierce debate in this area of conflict between individual freedom of information and social responsibility for a long time. Three quotations from classic philosophers illustrate this controversy.

In his *Areopagitica (For the Liberty of Unlicensed Printing)* (1644), John Milton wrote: 'There is yet behind of what I purposed to lay open, the incredible losse, and detriment that this plot of licensing puts us to, more then if some enemy at sea should stop up all our havens and ports, and creeks, it hinders and retards the importation of our richest Merchandize, Truth … I mean not tolerated Popery, and

open superstition, which ... it self should be extirpate ... That also which is impious or evil absolutely either against faith or manners no law can possibly permit, that intends not to unlaw it self.'

Over 200 years later, in his treatise *On Liberty* (1859), John Stuart Mill formulated a similar liberal position:

If all mankind, minus one, were of one opinion, and only one person were of the contrary opinion, mankind would be no more justified in silencing that one person, than he, if he had the power, would be justified in silencing mankind. Were an opinion a personal possession of no value except to the owner; if to be obstructed in the enjoyment of it were simply a private injury, it would make some difference whether the injury was inflicted on a few persons or on many. But the peculiar evil of silencing an opinion is, that it is robbing the human race; posterity as well as the existing generation; those who dissent from the opinion still more than those who hold it. If the opinion is right, they are deprived of the opportunity of exchanging error for truth; if wrong, they lose, what is almost as great a benefit, the clearer perception and livelier impression of truth, produced by its collision with error.

And naturally, it was none other than Karl Marx who took up arms against such a liberal attitude to censorship. His starting point was not individual freedom of speech but the profit interests of newspaper publishers. Thus it is no wonder that he criticizes the contemporary French press in the following terms: 'The French press is not too free; it is not free enough. Although it is subject to no intellectual censorship, it is subject to a material one, the depositing of large monetary securities. It thus functions according to material laws precisely because it has been dragged out of its true sphere into the sphere of large-scale trade speculations.'

This difference between a liberal approach to censorship and one based on a theory of social responsibility is to this very day the cause of differing constitutional opinions on press censorship and freedom of speech in many countries. In the countries of the former Council for Mutual Economic Assistance (CMEA) and in most developing countries, the social responsibility theory is far more important than any based on liberal principles.

But censorship need not only be organized directly by the state; it can also function via other mechanisms: (1) In an act of self-censorship, the communicator (journalist, film producer, newspaper editor) voluntarily distances himself from certain topics, or refrains from publishing certain pictures; (2) in an act of group censorship, a moral, political or economic pressure group intervenes in order to prevent or restrict the dissemination of information; (3) volunteer organs of self-control (press councils, codes of ethics laid down by publishers' or journalists' associations) do not see themselves as exercising censorship, although they do indeed regulate the selection of topics and of content.

The increasing significance of human rights in international politics in the last third of the twentieth century has caused the question of censorship to grow in importance globally. Increasingly more organizations around the world collect and publish data on censorship and on the political persecution of journalists, including the International Press Institute, the International PEN Club, the *Index on Censorship* journal, the French organization Reporters sans frontières, and the World Association of Newspapers. The latter, for instance, has stated that in 1998 there were 117 journalists in prison around the world, and that in that year a total of 28 journalists were murdered.

Without doubt, the mechanisms of censorship are also partly dependent on technology. In general it is true that digital global networking facilitates both censorship and avoidance of censorship. Whoever participates as an individual in an interactive electronic network leaves behind a digital fingerprint, and can be localized and even subject to individual electronic censorship. The opposite is of course also true: state censorship is scarcely capable of stopping a skilled network guerrilla.

At the end of the 1990s, precisely with reference to the Internet, there were numerous attempts made in many countries to prevent, repress or censor certain subject matter on the Web. Germany has laws prohibiting pornography and racism in cyberspace (1997), and Australia requires self-censorship by Internet Service Providers (1996). There are Japanese laws against Internet offences (1996). In China, Internet subscribers must register with the authorities (1996), and in Cuba there is control over individual access (1996). Malaysia monitors Internet contents (1996). Both the Philippines and the Republic of Korea enacted Internet censorship measures in 1996.

The digitalization of information allows content to be manipulated in an infinite number of ways. Digital photography allows a single image to be created from 500 individual images or more. During a live broadcast of a sports event taking place in Western Europe to an Islamic country, it is possible to cover up the open décolleté of a woman sitting in the grandstand. Both examples (which are from actual practice at the end of the 1990s) show that such concepts as censorship, manipulation, consideration for cultural sensibilities, or optimal targeting of a particular audience without loss of intensity due to scattering, are by no means clearly separable.

## PROPAGANDA

In 1621, under Pope Gregory XV, the Catholic Church set up a commission with the title *Congregatio cardinalium de propaganda fide* – i.e. a commission for the propagation of the Christian faith among so-called heretics and heathens. But the history of the current meaning of the word propaganda, derived from the Latin *propagare* (to propagate or spread), begins only in the era of Bismarck, in the latter third of the nineteenth century. In other words, propaganda is closely linked with technological progress in the history of the media. Both the means of delivering and the effectiveness of propaganda have grown and evolved from innovations in printing and the beginnings of film in the last century, to the beginnings of radio and TV in the 1920s and 1930s, to the digitalized multimedia world that exists at the end of the twentieth century. The twentieth century is a century of propaganda.

The structure and history of mass media propaganda are closely bound up with wars, with German fascism, with the Soviet Union under Stalin, and later with the Cold War. The First World War saw an initial flourishing of propaganda. In both France and Germany, war publications projected images of the enemy based on counterfeit

photographs and pictures – in newspapers, on postcards, and above all in the form of caricatures.

The beginnings of radio in the early 1920s also saw the birth of international broadcasting, which was from the start closely tied to political propaganda. The history of international broadcasting may be divided into the following four phases: (1) colonial broadcasting (1927–32); (2) european war and propaganda broadcasting (1933–48); (3) Cold War broadcasting (1949–89); (4) commercialization, and hate and crisis radio (1989–today).

Colonial radio began with the first broadcast by Radio PCJJ from Eindhoven in the Netherlands on 1 July 1927. It was followed by Radio Moscow and the German Weltrundfunksender (both 1929), the French Radio Colonial and Radio Vaticana (both 1931), and the BBC (1932).

Although the term propaganda has negative connotations in most languages, being interpreted as an unadmitted or even secret intent on the part of the communicators to influence the opinion of an audience without the latter's being aware of this influence, the German fascists employed the term positively. As of 1933, Joseph Goebbels' official title was *Reichsminister für Volksaufklärung und Propaganda*. The propaganda of the German fascists took the form of a rigorous bringing into line of all media. However, contrary to widely held opinion, radio was scarcely used as an instrument of explicit political propaganda during the Nazi period (1933–45). On the contrary, both radio and film were reserved mainly for entertainment purposes. The famous film theoretician Siegfried Kracauer bases his 1947 theory of the 'political in the unpolitical' on this politically motivated media policy.

It is by no means a coincidence that what today are called the communication sciences began in the middle of the Second World War, in the USA, as propaganda research. The basis of this research was a simple stimulus-response model involving a sender and a receiver, which was developed and used for both political and commercial advertising campaigns.

A definition of the Cold War would be impossible without the concept of propaganda. In contrast to a 'hot' war, i.e. a shooting war, political propaganda was the be-all and end-all of the Cold War. And once again, in this era international broadcasting played an outstanding role. Between 1948 and 1949 alone, the CMEA countries quintupled the number of their international broadcasts, and the US stations pushed the BBC from the top of the international broadcasting league, until they in their turn were overtaken by the Soviet international broadcasting stations at the end of the 1970s. The logic of the Cold War also made it a proxy war between the USA and the USSR for developing countries. Thus this period of international broadcasting saw above all a flourishing of international broadcasting stations in developing countries, led by Radio

*Table 28* **Activities by public relations agencies in wars, 1967–1993**

| Year | Client | Activity | PR Agency |
|---|---|---|---|
| 1967 | Biafran provincial government | PR campaign led by American opinion makers to support Biafran independence | Ruder Finn Global Public Affairs (USA) |
| 1968 | Nigerian central government in Lagos | Improvement of own image in the European press vis-à-vis the Biafran secessionists | Galitzine & Partners (Great Britain) |
| 1985 | UNITA rebels in Angola under Jonas Savimbi | Improvement of UNITA image in US press | Black & Manafort (USA) |
| 1986 | Marxist government of Angola | Improvement of Marxist government of Angola's image in US press | Gray & Co (USA) |
| 1990 | Government of Kuwait | PR campaign against Iraq, creation of negative image of Iraq in the press | Hill & Knowlton (Great Britain) |
| 1991 and 1992 | Government of Croatia | PR campaign among US politicians, government members and officials, media counselling, organization of tours for politicians, support for Croatian war aims | Ruder Finn Global Public Affairs (USA) |
| 1991 | Provincial government of Kosovo | Pro-Albanian PR campaign in the international media | Ruder Finn Global Public Affairs (USA) |
| 1992 | Government of Bosnia-Herzegovina | Contact with media, founding of Bosnia Crisis Communication Centre, organization of press conferences, international correspondence for the government, placing of leading articles in *New York Times* | Ruder Finn Global Public Affairs (USA) |
| 1993 | Government of Croatia | Intervention with American media politicians and scientists on behalf of Croatian war policy | Ruder Finn Global Public Affairs (USA) |

*Source:* J. Becker, 1997, Kommunikation und Medien. In: Hauchler, Ingomar et al. (eds), *Global Trends 1998*, Frankfurt, Fischer Taschenbuch Verlag, p. 390.

Beijing, Radio Cairo, Radio Pjongyang, Radio Havana, and Radio Tirana.

The latter third of the twentieth century has seen a hitherto undreamed of increase in propaganda through the development of a new business sector: governments waging war have commissioned public relations agencies to manipulate the global press and to mislead global public opinion. Table 28 lists the most important activities of this nature since the 1960s. One of the most outstanding examples of this kind of propaganda work was the testimony of the Kuwaiti girl Nayirah at a hearing before the US Congress in the spring of 1991 on Iraqi human rights violations in Kuwait in August 1990. The girl testified that Iraqi soldiers had thrown babies out of incubators in a Kuwaiti hospital. Whereas this 'incubator story' contributed to legitimizing US Gulf war policy, today we know that it was nothing more than a professionally prepared performance put on by a public relations agency that received a fee for its work. And incidentally, Nayirah was later revealed to be the daughter of the Kuwaiti ambassador to the United States.[3]

## CONTROL

According to the legend, Dionysos I of Syracuse (404–367 BC) possessed a whole range of surveillance and control instruments to keep an eye on communication. For instance, he is said to have listened in on conversations between prisoners in his dungeons, by means of long subterranean passages with special acoustic qualities that led into his house. He is also said to have set up megaphones in large stores, which were used to communicate orders. Everywhere in his palace, so it is said, there were speaking trumpets built into the walls which conveyed all conversations taking place there to his agents, such that the ruler was always informed of what was currently preoccupying his courtiers.

In other words, then as now the media are technical instruments with a dual-use character; as is the case with all technologies, the media are always a means of control and rationalization in a comprehensive sense. They can be used in both a communicatively liberating and a communicatively repressive manner, with concomitantly different effects. In this connection, Oliver Cromwell's 1657 justification for enforcing use of the state postal system is notorious: 'The post will be one of the best means of discovering and preventing dangerous and loathsome attacks against the Commonwealth.' Here too it is clear that there exists a systematic connection between free and controlled communication.

What is true for the British postal system under Oliver Cromwell is of course also true for later information technology. For instance, in 1920 the US Senate learned that all telegrams between the USA and Great Britain were being read by the British, on the orders of the British Admiralty in London. The background to this affair was as simple as it was alarming: the British Government had granted the American telegraph company in question the right to conduct its business, only on condition that it agree to the British Secret Service's plan of surveillance. This example of American-British information control is the classical precedent for the Echelon project of the late 1990s. In 1998 the Scientific and Technological Options Assessment Program of the European Parliament published

a study on Echelon. The latter is a surveillance and control system for the routine global tapping of fax, telex, email and telephone communication by United States secret services. In the Echelon project, the USA works together with the police and military forces of other countries.

Historically there has always been a very intimate relationship between communication and the military. The latter has helped to create a whole range of new information technologies and media, for which it has itself had an insatiable need. And in peacetime, though much more so in wartime, the military has controlled civilian communication structures.

Thus it is no wonder that it was the Swedish ministry of defence that in 1979 for the first time drew global attention to the growing vulnerability of modern computer networks. The notion of deliberately destroying computer networks has given rise to what has been dubbed at the end of the 1990s the 'information war'. In future wars, it will not so much be a question of causing the enemy material damage but of deliberately destroying his information structure. The focus of war will be, precisely, information war.

After the anonymous terrorist attacks on the World Trade Center in New York and the American Defence Ministry in Washington on 11 September 2001, many states greatly intensified their surveillance measures and information controls. Since then, civil rights in the USA have been drastically curtailed by the Patriot Act. This act grants the state great possibilities in the realm of information technologies for bugging telephone calls and reading e-mails, prosecuting computer hackers inside (and outside) the USA. It also considerably restricts the Freedom of Information Act, which, until now, has allowed citizens access to view government files. In Germany too, state control of information has been increased. Between 1995 and 2001 official surveillance of private telephone calls has increased five-fold with currently about 22,000 surveillance cases per year (needless to say without a parallel five-fold increase in the number of successfully investigated crimes). In view of such trends, the German philosopher Jürgen Habermas speaks of a 'restriction of the constitutional rights of one's own citizens'.

Information control is by definition especially difficult to establish in those cases in which it apparently takes place with the agreement of those who are being controlled. In the mass media, this is illustrated by the TV series *Big Brother*, which began in the Netherlands in 1999. In this series, 24 cameras register for 24 hours a day the activities of 'volunteers' in a closed living area. At regular intervals, TV viewers force one of the participants to leave the living space and end the game, voting by telephone or via the Internet. Are the TV viewers controlling the game? What is the difference between players and viewers? Which party is the more cynical? Experts are labelling this type of TV programme 'sensation', 'stress', or 'clink TV' – it is has already been exported with great success. Control through information technology and the mass media takes place independently of whether power is exercised by government or by private industry. Above all, it takes place in people's everyday lives. In industrial countries in the closing years of the twentieth century, socialization means above all media socialization. As agents of socialization, the mass media make a significant contribution to members of society's ability to comply with a range of social norms and role expectations, as they pass through social learning processes.

Integration as a concept can scarcely be separated from socialization. The mass media are the most important agents for integrating social communication. This is especially true of many young nation states who achieved independence only after the 1960s.

Admittedly, social control through the mass media has proved to be problematic in many ways. Firstly, a shifting of the socialization process from primary to secondary (media) experiences increases alienation; secondly the contents of media offerings are ethically questionable. Thus as early as the 1970s, Luis Ramiro Beltrán, the 'father' of Latin American communications theory, established that the following twelve elements constitute the basic norms of the world of TV: individualism, elitism, racism, materialism, adventurism, conservatism, conformism, defeatism, belief in fate, fixation on authority, romanticism and aggression. The large increase in the number of TV channels since the 1980s has probably led to a strengthening of these twelve basic media elements, rather than to plurality. For it is a sobering observation that the multiplication of TV channels has not led to an enrichment in terms of content but simply to a multiplication of the same old content.

Whereas up into the 1980s social control exercised via the mass media was demonstrably the result, effect and function of conscious political action on the part of state and government, the deregulation of the mass media under the pretence of neo-liberalism is bringing this state of affairs to an end. By pursuing a policy of deregulation, politics is voluntarily handing over control of the mass media to the markets.

## ACCESS

First of all, rights of access to information are quite old, and secondly, they are derived from two differing legal traditions. Thus the legal instrument of access to official documents was already recognized in the Swedish press law of 1766. This law exemplifies one of the two legal traditions, namely that of democratic control over government conduct with respect to information. The second legal tradition is based on the development of social rights in the form of participatory rights.

In the European Union, national rights of access to public sources of information exist in Denmark, France, Greece, and the Netherlands. In the Netherlands, such a right of access is even guaranteed by the constitution (Article 110). In the USA, rights of access to certain information sources are regulated by the Privacy Act of 1974 and the Freedom of Information Act of 1977. The 1986 Sandinista constitution of Nicaragua is also interesting in this respect: Article 30 regulates freedom of speech as an individual right; Articles 66 and 67 both include regulation of the right of access to information as a social right. All these laws and constitutions in one way or another regulate the right of access of citizens to collections of information held by the government or by public authorities.

Rights of access to information have the following functions:
- popular control of government and administration;
- transparency in executive conduct;
- endowment of citizens with informational competence.

Even from an economic perspective, rights of access to information are both important and an explosive subject, since in many countries government is still by far the most important and largest producer of information and knowledge, in the following forms:
- public school and university systems;
- offices for collecting statistics;
- the production of information (including concomitant publications) in all areas of public administration;
- extensive R&D activities financed by public funds;
- government activity with reference to patents and standards.

Contrary to popular belief, detailed access rights to information and knowledge in public archives would have considerable advantages for private industry:
- The ambiguous, unstable legal relationship between private and public information markets would become more stable and predictable.
- Public authorities would be forced to take precise stock of their information and knowledge, thus allowing for more effective business practices.
- Clearly formulated rights of access to information would reduce the number of publicly controlled copyrights, since under such clearly defined conditions everybody would have the same right of access to the same information.

Rights of access to information may conflict with other rights (such as rights of personality, data protection rights, industrial secrets, and security interests). As in many other legal areas, so in that of rights of access to information, there is a difference between de jure and de facto rights. For instance, rights of access may be rendered ineffective by prohibitive fees. In addition, rights of access to information assume the existence of a knowledgeable citizenry that is aware of possessing such rights. Thus rights of access can de facto be effectively claimed – with some chance of success – only by a socially privileged class of 'information rich'.

A consideration of rights of access to information are (directly or indirectly) also to be found in all debates on social rights. But there can be no right to development, such as was formulated in a UN document in 1978 by the African expert in international law Kébe M'Baye, if there is no guarantee of access to information. A right of access to information guaranteed in international law becomes more important, and from the point of view of Southern countries more logical, the more the gap between the 'information poor' (developing countries, small countries, national minorities, impoverished sectors of the population in industrialized countries) and the information rich (the USA, the EU, Japan and some fast-developing Asian countries) increases – i.e. in the whole area of high tech. It was precisely against this background that, in the 1970s, lawyers and communication scientists Jean D'Arcy, Desmond Fisher and L. S. Harms developed the legal concept of a 'right to information' as a social participation right, a concept which they later developed into a 'right to communication'. In the MacBride Report *Many Voices, One World*, addressed to UNESCO in 1980, L. S. Harms formulated the case for such rights thus:

> Everyone has the right to communicate: the components of this comprehensive Human Right include but are not limited to the following specific communication rights: (a) a right to assemble, a right to discuss, a right to participate and related *association* rights; (b) a right to inquire, a right

to be informed, a right to inform, and related *information* rights; and (c) a right to culture, a right to choose, a right to privacy, and related human *development* rights. The achievement of a right to communicate would require that communication resources be available for the satisfaction of human communication needs.[4]

From such considerations the MacBride Report came to a single conclusion:

The call for democratization of communication has many connotations, many more than are usually considered. It obviously includes providing more and varied means to more people, but democratization cannot simply be reduced to its quantitative aspects, to additional facilities. It means broader access to existing media by the general public, but access is only a part of the democratization process. It also means broader possibilities for nations, political forces, cultural communities, economic entities, and social groups to interchange information on a more equal footing, without dominance over the weaker partners and without discrimination against anyone. In other words, it implies a change of outlook. There is surely a necessity for more abundant information from a plurality of sources, but if the opportunity to reciprocate is not available, the communication process is not adequately democratic. Without a two-way flow between participants in the process, without the existence of multiple information sources permitting wider selection, without more opportunity for each individual to reach decisions based on a broad awareness of divergent facts and viewpoints, without increased participation by readers, viewers and listeners in the decision-making and programming activities of the media – true democratization will not become a reality.[5]

Rights of access to information are a controversial issue in the conflict between North and South in so far as the developing countries seek to use these rights to guarantee access to the knowledge of the rich industrial countries, whereas the latter vehemently refuse such access as not in accordance with the laws of the market. On this point, it is interesting to note that the legal concept of 'access to data and information' also occurs in the OECD Declaration on Transborder Data Flow of 1985. As the developing countries are not represented in the OECD, the guaranteed rights of access to information in question here have to do with a very different set of interests: the Europeans in the OECD were concerned that they might be cut off from American information sources.

In the world of digitalized electronic networks, problems of access have increased in complexity on at least two levels. First, faced with an information and communications sector, which is expanding at a tremendous rate, the priority of most European constitutions must be to reach a clear understanding as to what are so-called basic services and what are so-called Value Added Network services. It must be a matter of general agreement that basic services be subject to public infrastructure control that has constitutional weight behind it. All citizens should have free access to such basic services. Second, this political problem is accompanied by one of a technological and economic nature. Digital TV is based on three technologies: multiplexing (the digitalization of programme content), navigation (electronic programme guidance) and conditional access (encryption technology). Whoever has sole control over these three technologies can determine which programmes viewers may access. These new technologies considerably complicate the problem of access. In addition, this whole complex of problems has a further influence on economic competition in the digital TV sector.

Ever since the US telecommunications concern AT&T launched its advertising slogan 'One system, one policy, universal service' in 1909, the meaning of the concept 'universal' has never been clear. Does it mean 'everywhere' or 'for everybody'? And is the concept to be interpreted empirically or normatively? Should it be intended as a normative claim, then one would have to examine very carefully whether the right to communication as a basic human right hides nothing other than a desire to create ever-expanding markets.

## CONCLUSION

Information technologies and the mass media have radically altered the relationship between individual and society in the twentieth century; above all they have altered the relationship between intimacy and publicity. The American sociologists Richard Sennett and Christopher Lasch describe these changes in their books *The Fall of Public Man* (1977) and the *Culture of Narcissism* (1979), respectively. By establishing a quasi-intimate relationship to their public via TV, politicians have helped abolish public life and replace it by the tyranny of intimacy.

The twentieth century has been above all a century of news services of the most comprehensive kind. The most important agent in the systematic collecting, reading and accessing of exclusive data has been the state. Its power vis-à-vis the individual has been based on its ability to employ statistical methodology and information technologies in order to collect, store and evaluate data on the entire population as it aged, as it lived and travelled, in sickness and in health. With deregulation of information technologies and the mass media at the end of the twentieth century, and with the emergence of globalized societies, the state and the rationale it embodied are becoming increasingly less efficient. The networking of society, through distributed networks, heterarchical forms of communication, and interactive media is multiplying, individualizing and decentralizing Big Brother. In collecting, reading and accessing information, government authorities must compete with non-government institutions: industrial concerns, organised crime, and terrorist organizations.

In 1956, the Austrian philosopher Günther Anders published his two-volume work *Die Antiquiertheit des Menschen*. Speaking of TV, he coined the term 'mass hermit'. He was referring to television's tendency to create a form of depoliticized individualization. What Anders, writing before the age of TV, conceived of theoretically has after fifty years of mass TV culture become reality. Television, having isolated the individual, has created a breed of mass hermits who are incapable of political engagement. At the end of the twentieth century, the American social scientist Reg Whitaker has spoken not of the mass hermit but of the end of privacy, and the German political scientist Volker Gransow has declared that mass communication is incapable of generating dialogue, having evolved into a form of autism, in which the individual communicates simply with itself.

## NOTES

1.  K. G. Wilson, *Technologies of Control: The New Interactive Media for the Home*, Madison, WI, 1988.
2.  D. Banisar, 'The Privacy Threat to Electronic Commerce', in *Communications Week International*, 29 June 1998.
3.  M. Beham, *Kriegstrommeln: Medien, Krieg und Politik*, Munich, Germany, 1996.
4.  S. Macbride (ed.), *Many Voices, One World: Communication and Society, Today and Tomorrow – Report by the International Commission for the Study of Communication Problems*, Paris, 1980, p. 173.
5.  Ibid., pp. 173–74.

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# C

REGIONAL SECTION

# 30

# WESTERN EUROPE

## *Pascal Ory* and *Dominique Pestre*

### SCIENCE AND TECHNOLOGY IN WESTERN EUROPE SINCE 1914

The countries of Western Europe played a leading role in science and technology throughout the twentieth century. Their direct contributions include the invention and production of knowledge, the specification of practices and establishment of norms, technological developments and the creation of high-tech and science-based manufacturing. To assert this much, though, is not to imply that nothing changed in the course of these decades; on the contrary, there were many transformations, both in the importance of Western Europe relative to other countries and regions of the globe, and in the manner in which the production of knowledge was organized and linked with politics, society, the economy, law, and cultural and military concerns. Before 1940, Western Europe's role in the production of scientific and technical knowledge was crucial, and often preponderant; but in the immediate aftermath of the Second World War, it became much more restricted and though still considerable, was no longer dominant. In addition, the manner in which knowledge itself was generated underwent major changes in the course of the century, both in terms of its organization, regulation and assessment, but also regarding the 'products' techno-science proposed, particularly as applied to technology. Not to belabour the point, we could simply observe that the century's first seventy years were characterized by one 'regime' of science production and regulation, while another somewhat different regime took its place during the last thirty years. The first of these regimes may in turn be subdivided into two periods, separated by the Second World War.

The best way to approach the subject in hand, therefore, is to proceed chronologically; and our first task is to show in what ways the first two thirds of the century differ from the last. There are two crucial notions here: (1) during the first period, the production of knowledge was essentially a matter for national governments; it was dominated by the building of (and international equilibrium among) nation states; for the last thirty years, by contrast, it was a much more widely distributed affair, the many parties involved operating in a political and economic world that we may provisionally describe as one of globalization and liberalization; (2) between these two phases, science and technology radically changed their own ways of working; they have shown a great capacity, through IT and biotechnology, for transforming our physical, social and personal worlds, and have accordingly given rise to public dissent (e.g. the vigorous debate on genetically modified organisms [GMOs] in the 1990s) – in contrast to the earlier period's relatively general consensus, which approved of science and indeed on occasion idealized it. We thus have a fairly clear difference between the period 1910–70 and the three following decades, in terms of the production of scientific and technical knowledge, the form such knowledge took, the way it was received by society, and the way it has transformed and complemented our lives.

There are also some very noticeable differences between the century's first four decades and the three that followed the Second World War. The most radical difference between these two periods was something set in motion by the war: the pre-eminence of military considerations in the evolution of science and technology, and the fact that war did not stop, but shifted almost imperceptibly from a 'hot' to a 'cold' war. This entailed a sustained mobilization of the best scientific establishments in East and West; science was deployed both for the creation of new physical devices and also for optimizing the organization of people, processes and systems along operations research lines and transforming the management of both production and administration. Developments in electronics, nuclear technology and materials science led to major transformations in industry, the art of war and everyday life. The role of the state in society (the post-war heyday of the welfare state) and in the economy (as Keynesian policies became standard) reached tremendous proportions.

This chapter will accordingly be arranged in three main sections. The first will expound the idea of a 'regime under which technical and scientific knowledge exists and is produced', over time: it will consist of general observations and some methodological points. The second section will deal with the years from 1900 to 1970; after some description of this crucial period as a whole, distinct subsections will be devoted to its two divisions 1900–40 and 1940–70. The final section will deal with the century's last three decades.

## SCIENCE PRODUCTION AND REGULATION IN SOCIETY

We often speak of science as if it consisted of 'pure' knowledge, which is developed within the special surroundings of academia, and finds (or does not find) applications elsewhere. This perception is fraught with difficulties pertaining to the new knowledge invented in Western Europe some four centuries ago, and particularly so for the hybrid of technology and science that blossomed from the end of the nineteenth century and totally dominated the twentieth. Ever since the moment in the seventeenth century we commonly call the Scientific Revolution, science in the West has been viewed as a means of interacting with the world and a way to master it for practical ends. Ever since this redefining of the way knowledge is acquired and especially the role of experimentation and mathematical formalism that distinguishes 'modern science', the trinity of discovery, instrumentation and invention have been intimately linked. Despite the close interrelations, the reorganization and creation of modern science has never been a single operation (conducted by an institution such as the Royal Society or by an outstanding individual such as Galileo). Nor was it the working out of an explicit, unequivocal or even deliberate programme (e.g. the 'Baconian programme' or the 'mathematization of the world'); nor did it have a single source (the revival of Platonism), or reflect the *implementation* of any coherently pre-conceived project: on the contrary, the mutation was the doing of many participants with at least as many motivations, all aiming independently at their own objectives – but in their interaction generating a shift in the overall economy of knowledge and its production, a radical transformation in the ends pursued and the means employed, a transformation of ourselves as social beings and of our potential, our capacity to act on and make use of the world.

This overall mutation was the doing of the knowledge-producers on the one hand – in universities, naturally, but not exclusively, as there were also the Jesuits, the designers of fortifications and artillery, the researchers in Academies and Observatories, and the worlds of the architect, the naturalist, the navigator and traveller, the progressive agriculturalist – but also of the authorities, temporal and spiritual, on the other hand, all adapting to and profiting from the changes around them in pursuit of their various objectives. These institutions included the princely or royal courts, arsenals and warriors, trading companies and entrepreneurs, philosophers and theologians, politicians and critics. It was the doing of a colonization or penetration of the universities' narrowly defined classical purview, with its particular practice of 'natural philosophy', by new procedures and new approaches. The most important

among these featured the *ingenium* (source of both 'ingenious' and 'engineering' in English), of the mechanical arts in combination with mathematics. Such colonization led to a revolution in the nature of intellectual work, an utter transformation of the ways of thinking and understanding (from those of the academic scholar to those of Galileo, Pascal and Boyle), of the place of mathematics in explication, of the relationship of knowledge to experience – from the everyday *experientia* available to all, the favoured criterion of the Aristotelians' treatises, to the private, contrived *experimentum*, rigorously controlled by devices and mechanisms. It led to a change in the kind of debate acceptable among natural philosophers (from the formal public disputation to Baconian-style reporting of observed 'facts') and in the kind of place where such work must be conducted if it was to be legitimate and 'valid': professional scientific discussion in association with what we recognize now as the laboratory.

These are familiar points, sketched here only in outline; but what we still need to do is to work out the overall structures organizing the production and regulation of knowledge at a given moment in history and a given region of the world. In short, we need to describe the various ways in which the sciences exist within society, the various arrangements or, as we prefer to put it, the various *regimes* under which knowledge exists, is produced and regulated.

The idea of a 'regime' for the production of scientific knowledge is based on two observations. First, the fact that what we include within the scope of the term 'science' is by no means a 'thing', objectively delimited and stable over time, which we need merely describe ('science is a system of mutually consistent statements', say, or 'science is the activity of pure knowing'. No: science (or should we say the sciences? or scientific practice?) is made up of a whole set of relations involving *perceptions* and *issues* which may vary depending on the individual or group; all sorts of products (writings, results, techniques); practices (instrumental, modes of calculation, simulations); values and standards (epistemological, moral, behavioural); institutional surroundings (laboratories, schools of engineering, start-ups); avenues of connection with the political and social world (salons, amateur groups, learned or professional societies) and many other things besides. This concept of a *regime* for the existence and production of knowledge is based, then, on the fact that there is at any given historical moment a particular arrangement of all these elements, and that arrangement takes the form of a certain social understanding and certain practices of production and political management. Science is always embedded within given social and political forms; it depends on and in turn helps to shape the individual and collective existence of human societies, their forms of organization, and their social values.

The idea that there are regimes for the production of knowledge refers therefore to a legitimate structure of such knowledge, to a hierarchy ('mechanics is the most complete science in 1900') and to a way of life in the world. It refers to a particular form of regulation (the peer evaluation system, as opposed, for example, to the setting of science policy by the state) and to a style of social existence (consider the high status of 'pure science' and, by contrast, the promotion of the 'scientific entrepreneur' nowadays). It also refers to an expression of priorities in actual social circumstances, to the fact that the regulation of the world of science (modern

biotechnology, for instance, regulated by new rules for intellectual property) is not independent of the current forms of social or economic regulation. A shift in one register (the state and industry become major commissioners of science in the twentieth century) opens up possible shifts in others (science must develop metrology and cultivate precision to the utmost) – and vice versa (the mechanics of high precision was the precondition, via the provision of accurate machines, for the second industrial revolution; biotechnology radically influences our lives via the pharmaceutical companies and agro-business). Lastly, this idea of regimes governing the production and regulation of knowledge refers to the standards according to which, whatever the register, not only truth and falsehood are predicated, but also, to a great extent, right and wrong, good and evil, the desirable and the undesirable, the noble and the base.[1] It contributes directly to our determination of what is legitimate and good, which governs the relationship between knowing and not-knowing and that between individuals and groups. In short, the notion of 'regime' postulates interdependence among human activities and the existence of systemic effects that never fail to have their impact on the sciences and constrain them to take their place in history.

### Science/technology, industry and governmental regulation within the framework of the nation state: the regime of knowledge from 1914 to the 1970s

This period, which started without any break the last third of the nineteenth century, saw a radical transformation of science and scientific practices, and of what it meant to 'be scientific' or to 'do science'. This was the age in which science developed a new set of production sites and procedures both in the laboratory and in theory. The universities opened up to technology and to industry (a phenomenon accentuated by the First World War); science became a core ingredient in the means of innovation, an essential tool in the arrangements of mass production – and a means of bureaucratic and industrial rationalization. Like other parts of the social organism, the laboratory became a more organized, more hierarchical place where the division of labour prevailed in the form of specialization. Science was taken in hand by national governments and mobilized for the preparation of war; it became an indispensable resource for the building of the nation state. In terms of education, this change meant the end of the Socratic ideal of wisdom so far as the hard sciences were concerned, or at least its marginalization.

This transformation of science meant a change in its purposes, its tools and its standards – and also in the sheer scale of the undertaking (the Bell laboratories were already employing many thousands of people in the 1920s). Indeed, we may speak of the predominance in this period of an academic and industrial science/technology on a massive scale, quite incommensurate with what had gone before; of the rise of a new social and technical construct characterized by three features: an increased efficiency of specialist scientific knowledge, most notably for industrial and military purposes; a concomitant interest in and sharply increased support for the products of science, and scientific activity in general, on the part of the various centres of power; and a proliferation and diversification of

sites at which knowledge and invention were produced, and of forms of dynamic interaction among all those involved, one way or another, in the mobilizing of science.

Thus science was reformulated; and this transformation of scientific practice, this emergence of a new regime for science and technology took place in a close and organic connection with a redefining of economics and politics, of the criteria of social justice – and of what 'the state' is, or ought to be. The primary thrust here, so to speak, was an idea that could perhaps be expressed thus: in the context of a balance of power among nation states engaged in preparing for a coming war (the Second World War, or a nuclear exchange with the USSR, depending on the period), a Science State becomes established, concerned with science, technology and invention for the higher good of the country; a War State, preparing to defend economic, political and imperial interests; a Social State, taking thought for the problem of the dangerous classes and guaranteeing civil peace. The establishment of these three aspects of the state proceeded in parallel: they constitute different facets of a single ambition, different branches of a single enterprise, to be found from Berlin to Paris to London, in Moscow as in New York.

Five particular points will bring these general ideas into better focus:

First, during most of the twentieth century competing nations defined themselves by their capacity for total mobilization, whether for self-preservation or expansion – and that included the mobilization of science and technology. The state was the entity which united the nation, which saw to its mobilization, and which coordinated it internally as well as for action abroad. The state apparatus allied itself with science and industry to prepare for war (on economic or ideological grounds) and to prosecute it successfully once actual fighting broke out. This they did through the production of weapons for the front and the mobilization of economic, social and political forces at home. In certain cases (Weimar Germany, for example) a lack of confidence in the state could lead particular elements, for instance industrialists and academics, to take its place as the embodiment of the nation and provider of its necessary defence.[2]

Mass violence was an object of theory – and indeed practice – during this period scarred by many conflicts both among states and between governments and sections of society: among the manifestations of this violence were the Holocaust, two instances of total war and one of a techno-scientific war many decades long (the Cold War), colonial conflicts that lent themselves to the foulest massacres (the systematic aerial bombardment of civilian populations, though it became a standard practice during the Second World War, was invented to quell revolts by colonial subjects) – and some political regimes that ruled through the everyday use of brutal repression. Violence has not, of course, been confined to the twentieth century; but that century did see a particularly inhuman violence, scientifically organized, technically rationalized, and with the close support of the highest practitioners of science.[3]

Second, during these years the state apparatus occupied a greater place in the general economy of our societies than ever before. True, the liberal creed continued to be reaffirmed; the market remained the predominant form of regulation; but the state became an omnipresent player, intervening with more and more legitimacy to regulate

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social affairs (with precedents established before 1914) and economic ones (from the 1930s onwards). Through taxation, it drained off an increasing proportion of national income after 1914, and from 1940 especially it became a key player in industry as well as in health policy. Forms of state-organized insurance had already been introduced in Europe by the end of the nineteenth century, through a combination of collective management and social groups with strongly defined subjective identities: the working class, for instance, represented by its trade unions and political parties, and more generally the classes and categories 'invented' – solidified – by the social sciences and the state apparatus, which gave them existence intellectually (in scientific sociology, for instance) and politically (in the operation of the Plan, or through collective bargaining agreements in France during the 1950s and 1960s, for example). For the state, as guarantor of social order and national power, social stability depended on a compromise between the classes, under its own leadership. In short, the state in this period became the arbiter for all of society, at the expense of self-government by civil society. This social state, or 'welfare state' was of course the inseparable reverse side of the 'warfare state', and the necessary condition for its deployment.[4]

Thirdly, over these sixty or seventy years the world of manufacturing was being remade in its objectives as well as in its practices and structures: mass production became the norm, as both products and forms of work were standardized. Factories saw new, scientific ways of organizing work and managing production (Taylorism, Fordism), and offices new ways of handling information and workflow. This was the age of the mega-organization, above all of the great industrial structures relying on science and technology for the basis of their power. The first large-scale industrial systems had, it is true, appeared during the nineteenth century (the railways, for instance); but it was between 1914 and 1970 that they became truly widespread and standard. More generally, these were the years when large-scale systems based on science came to dominate, when economies built on the rational mobilization of knowledge were built, in the laboratory, in the time-and-motion department, and on the assembly line. This movement towards large-scale production involved not only mathematics and the natural sciences, physics, chemistry, biology, medicine and hygiene, agronomy, but also the social and human sciences, including economics and management.[5]

Fourthly, science made its way (not least through the establishment of precise measurement standards) to the very heart of exchange and production, the rational running of huge organizations, and the innovation in product and process that provided the engine for the international economic and military struggle (continuously developing newer devices, designing new industrial or military products, refining production processes – in short, making all activities scientific). There came a certain equilibrium, or division of labour, between open, public science, whose primary seat remained the university, and a private science embedded within enterprises – the two being coordinated by a traffic of star researchers back and forth between the two worlds, and by the actions of the state, which had itself become an impresario of science. Thus a balance arose in the twentieth century among three worlds: science as the 'autonomous' affair of academic savants in universities and institutes of technology; socialized basic research and

standard-setting by governments and state institutions; and research conducted within industry. Lastly, there was a dominant belief in the possibility of a rational and superior point of view which could provide 'the' solution to any problem: with incontestable scientific credentials, and strongly allied to industrialists and to the state apparatus, the Expert ruled supreme.

Fifth, in knowledge itself there were four major trends at work during these years: (a) a tendency in favour of a generalized reductionism, made possible and effective by the mastery of phenomena at very small scales in the laboratory and by new theoretical approaches; these were the characteristic features of the physics of electrons, atoms, nuclei and 'elementary' particles, and later of genetics and molecular biology; (b) an attitude which was very often, under the influence of the industrial and military laboratories, a pragmatic one, prepared to mobilize all available means regardless of the established subject-boundaries of the university; such practices had appeared in industry as early as the closing years of the previous century, but were taken up by governments and by the military after the Second World War (operational research, for example, or the management of major projects that called for a redrawing of the boundaries between disciplines, such as materials science in the 1950s); (c) a greater use of mathematics and formalization procedures in general, and the extension of their realm to the whole of science and technology, and to its management, and eventually to the study and control of society as well; approaches based on statistics and calculation became general in all efforts to grasp reality: model-building, in particular, and later simulation; (d) a tendency in applied research and engineering towards fundamentals, an increasing emphasis on basic, formal science (in electrical engineering, in agriculture), as well as the central and primary role of scientists and engineers in the establishment of a widespread practice of precise measurement.

We shall now clarify these points further by studying two sub-periods in greater depth: one from the 1900s to the 1930s, and the other from the end of the 1930s to the 1970s, including the Second World War.

## From the 1910s to the 1930s: Nation states, the international balance of power, and science[6]

In order to understand the interwar years we need to go back a little further, for it was at the end of the nineteenth century that a new industrial world emerged, one already committed to the latest scientific inventions – the telegraph, chemistry, electricity, electrical technology – and moving towards radio, agricultural chemistry and, before long, materials science. That time also saw the creation of:
  – New teaching establishments: science faculties radically reorganized; additional capacity in the form of newly founded universities, schools and institutes of technology of all kinds, springing up in their hundreds the length and breadth of Europe.
  – New kinds of site and workplace: for instance, the research laboratories that appeared in industrial surroundings in the last decades of the nineteenth century and became the rule after the First World War in many European countries (and also in the United States: the majority of American physicists

were working in such places as early as the 1920s), or the agronomy research centres and 'extension' institutes, or standards centres such as the Physikalisch-Technische Reichsanstalt in Germany or the National Laboratory in England. These research institutions were of capital importance for the new economy, and had the task of developing the essential norms and standards for interconnecting networks, trading in products, the proper functioning of manufacturing processes, and the management of markets in general (definition of units, calibration, technical standards).

– National research agencies financed by the state (and sometimes by industrialists), aimed at socializing a portion of research and what later came to be called development: One example was the Caisse National des Sciences and the later CNRS in France, modelled and remodelled over four decades, which did not attain a final (massive) form until war was looming at the end of the 1930s, with the scientific mobilization of 1938; another was the Kaiser Wilhelm Gesellschaft in Germany, founded in 1911, whose laboratories developed over the following decades and which was joined by other institutions after the defeat of 1918; or the Department of Scientific and Industrial Research in England, a by-product of the war effort, established in 1915 but playing a central role in the interwar period as a coordinator of the country's civil as well as military research; or the Consiglio Nazionale delle Ricerche set up in Italy at the end of the war; and there were others.

– National laboratories, i.e. laboratories set up from scratch by governments in new areas of great technical potential (such as aviation after 1918), and intended to serve as cross-fertilizing links between the two worlds of academia and industry.

Laboratory work, for its part, was transformed: its products (both things and people) became the result of a hierarchically organized professionalism. This was the start, among other things, of the general institution of the teaching laboratory in universities, a place for training the new scientist/technicians, where know-how and mastery of instrumentation were the watchwords. To take just one example, from France at the very start of the century: the Curies' laboratory, remarkable in that the Curies are always quoted as being exemplary practitioners of 'pure' science. What we need to remember is that the Curies built the French radium industry from the ground up. Two years after the discovery of radioactivity, they sought the collaboration of a company, the Société Centrale des Produits Chimiques. André Debierne, the Curies' assistant, set about converting their laboratory techniques into industrial procedures, and was rewarded with a share of the radium salts extracted. Five years later, Marie Curie began working in collaboration with an industrial chemist, Emile Armet de Lisle; this time, it was Jacques Danne, editor of the journal *Le Radium*, who organized production. In 1907, Danne started his own laboratory, manufacturing instruments based on those in the Curie lab; and in 1908 another researcher left to set up the measurement and purification department of a company, this one founded by Henry de Rothschild.

Such behaviour – by no means exceptional in the world of French or other European laboratory-based science – is explained partly by the fact that only industry could provide

the material resources for the systematic practice of scientific research (in this case, radioactive elements of sufficient quality), but also by the fact that the researcher owed a duty to her or his country and its economic development. This requirement is clear in Marie Curie's lectures, when given to engineers, on the design of instruments for use in prospecting and in industrial activities, as well as in the continuing interest in medical applications. Pierre Curie was the first to address radium's biological effects and to work with doctors, while in the early decades of the new century Jacques Danne and other engineers who had been trained at the City of Paris School of Industrial Physics and Chemistry (where Langevin, Pierre Curie and later Joliot also studied) all contributed to the preparation of calibrated sources for medical treatments, and the evaluation of the dosages required for medical applications.

In this period, also, the physical sciences adopted a new approach more concerned with fundamentals; it provided a new conception of scientific research and laboratory practice, tending towards a reduction to underlying entities and a regression to the 'elementary' building-blocks of matter, whose combination should make it possible to explain the macroscopic world of the senses. It was no longer enough for science to study phenomena and construct systems of equations linking macroscopic parameters in order to progress towards a definitive and descriptive body of laws (e.g. Joule's Law relating work, electrical resistance, and the intensity and duration of a phenomenon). On the contrary, science was now opening a whole new Pandora's box, looking with the aid of the new instruments at the underpinnings of our world, on a scale which is not ours and had for that reason been left out of the rational world of earlier centuries' science. No longer was the agenda the mastering of phenomena by dint of finding the right shorthand for the interrelationships among the various macro-components (electric fields and intensities, for example), but the giving of experimentally verifiable meaning to the ancient notions of atoms and corpuscles, catching the infinitely small in the snares of experiment – and taming it, making it useful in its turn.

This work required not only new theoretical tools (quantum mechanics and its attendant philosophical issues were of course at the heart of this reform in the 1920s, from Copenhagen to Cambridge, from Paris to Göttingen) but also a radical transformation of the experimental techniques and standards defining properly conducted work. This was the product of the small-scale physics of the electron, discovered in the last decade of the nineteenth century (first in the Cambridge laboratory of J. J. Thomson and then spreading across Europe early in the new century), the discovery of radioactivity (initially in Paris), and then the physics of the nucleus and its constituents (again at Cambridge, with Rutherford and his circle, but also in Paris with Mme Curie, in Berlin with Otto Hahn and Lise Meitner, in Vienna, and elsewhere); it remained for nearly thirty years (until the emergence of an operational quantum mechanics) a more qualitative, composite physics than the 'precision physics' exemplified by classical optics and electromagnetism. To borrow Carlo Ginzburg's terms, we might say this was a physics governed more by a 'clue-based' paradigm than by a system of precise measurement and exactitude.

The years from the end of the nineteenth century to the 1930s, then, are those of the discovery of the 'particles'

themselves (they were to proliferate into a veritable menagerie after the war) – but, even more, they are the years when experimental techniques and materials were mastered, leading, over these three decades, to vacuum-tube electronics (diodes, triodes, magnetrons and klystrons, which proved vital for radar when war came) – and also to nuclear technology. Even in the century's first two decades, companies were recruiting electron specialists with the deliberate aim of improving telecommunications.[7] The same experimental expertise also led to atomic physics and chemistry (using the Bohr model of the electron cloud, and quantum physics) and to a new science of materials (most perfectly exemplified by the semi-conductors which were at the heart of these projects). More generally, the mix of high theory and practical concerns invaded these laboratories, and a readiness to cross subject boundaries appeared, along with new links among craft skills, industries and universities – the whole ensemble leading to powerful revolutions in scientific knowledge, techniques and industry.

This new way of doing physics, invented in Europe during this period, is (in its metaphysics, its modes of work and of explanation, its techniques, its standards for success or failure) a departure in a new dimension from the phenomenological physics of laws and the physics of precision which dominated the universities at the close of the nineteenth century and was the basis for the industrial revolutions of the telegraph, industrial electricity, and radio.[8] That physics by no means disappeared; on the contrary, it remained at the heart of most applied science until the 1930s, not least in its standard-setting and metrological functions. The techniques of astronomy and physical optics continued to provide the most effective means of defining the calibrations required by the mechanical arts, and mastering them for practical purposes (the interferometers of Fabry and Perot, for instance, as measuring and calibration tools in mechanical engineering before 1940). They were vitally necessary for industry. Nevertheless, another approach had arrived, one which was less concerned with precision and the establishing of standards for industry at the outset, but which would increasingly become, during the 1930s and the war years, the most powerful means yet of transforming the material world: theoretical and experimental physics at atomic and sub-atomic levels. It would do still more: it would go on to increase the scope for human action on the world, and after the war would open the door to a new stage in the history of humanity.

The new approach came later in the biological sciences, not really beginning until after the Second World War. Nevertheless, the early years of the century saw the appearance of genetics (Morgan and his school), the development of statistics in agricultural science, and the general adoption of the Pasteur model closely linking the study of microscopic organisms (bacteria), laboratory practices and laboratory products (serums and vaccines), and social practices of new kinds (the reform of hygiene).

At this point we should clear up one last thing: in the period we are considering here, the world of technology, science and industry was not the only scene of innovation, nor the only world that mattered. This was also a crucial moment in the consolidation of the nation state. It was in fact not only the time when what we like nowadays to call the 'knowledge industries' appeared, but also the moment when the nation was fully deployed and consolidated –

through the teaching of and reflection on history, through labour legislation and social security schemes; but also the moment when it took root in a material way through systematic investment in the technical and scientific fields. In this new world, scientists were no longer 'intellectuals', but professional specialists devoted to their individual subjects and to the pursuit of an advanced and highly specific knowledge. Their training was no longer a matter of passing on the search for knowledge and wisdom; it meant turning out specialists who had rid themselves of anything other than what would make a decisive contribution to the chosen field of practical, goal-oriented research. This was, indeed, the very issue between Ernst Mach and Max Planck in their great debate on the future of science before the First World War.

What we see here, then, is a profound secularization of science and its activities, their embedding deep within the industrial and ideological framework of nation-building. Where science had, at the end of the nineteenth century, been largely a private, local affair (carried on by regional academics and industries, in France for example), it now became the business of the country, of the nation state. In this sense David Edgerton speaks of a 'nationalization' of science, a process through which it became a major issue for the state, on an equal footing with military power and industrial peace: the development of science and technology became a shared concern of politicians, industrialists, and the military, as well as the grandees of science themselves. We can see differences from country to country in the forms this development took (from the organic collaboration in Germany of industrialists, Länder and national government, to France, where innovation in companies still depended mainly on the production designers rather than on separate research departments), but the establishment of a knowledge-based economy became a central issue in struggles for world domination.[9]

### From the end of the 1930s to the 1970s: the Second World War and the Cold War

The mobilization of 1938, the Second World War and the Cold War that followed without a break mark the high point of the integration, begun in the previous period, of industry, science/technology, and the state – with its duties of waging war, maintaining social unity and providing the framework and sustenance for a mobilization of the whole nation. This was the flowering of the welfare state model, the system of protection for the weakest under active government protection; this is the coin whose other side was the 'warfare state', organized on the self-same basis. Both states were powered by science. This is the characteristic we turn to now.

At bottom, the culture of the years 1940–70 was one of constant emergency and permanent mobilization. Driven by a faith in utterly perfectible technology encouraged by the successes of the Second World War, these decades could not imagine that technique allied to science might not be able to solve all problems. This faith was universal throughout the industrial, political and scientific elites, and showed itself in the widespread belief that science was the origin of all technical development, which was in turn the source of industrial, economic and social progress (so ran the theories of the economists of technical change under the

linear development model).[10] The examples it could point to were Los Alamos and the enormous industrial complex set up by DuPont de Nemours to produce the fissile materials needed for the American nuclear programme – and it was this faith which drove research into nuclear fusion in the United States, Great Britain and the USSR until the mid-1950s; it underpinned the pharmaceutical industry's anti-cancer programmes and the scanning of molecules by mass-production methods; it established the policies that reorganized the farming world for ever greater 'productivity'. In every case developments were powered by the belief that coordinated technological and scientific action could, if enough resources were applied, do away with any difficulty and would lead to the solving of all problems, including social ones. These firm beliefs led to increasingly technocratic versions of politics, economics and military strategy, making great use of models and computers.[11]

The culture which thus came to flower during the war was not only a cult of the laboratory solution (technical devices, revolutionary molecules, new seeds). It was just as much a culture of management, of action for which science provided the framework, of subjecting populations to experiments (always thought of as legitimate and modernizing) – it was a culture of analysis and planning, stemming from a central core where those with the greatest power and prestige were those with knowledge: the state and the experts, scientific and industrial. During the Second World War and the Cold War, the military and the industrialists learned that if solutions were to give quick and effective results they must always be technical and logistical, must involve hardware and personnel management. It was the same for health: if the new molecules were to be properly evaluated, and the neutrality of the assessments publicly guaranteed, large-scale treatment trials must be organized. The industry had, it is true, conducted procedures of this type as early as the nineteenth century; but the change in the scale of these activities, the new, centralizing role played by the machinery of the state (often the key actor in decision-making processes because of the war situation), the voluntary mobilization of the best scientific and mathematical brains and the unshakeable trust in the legitimacy of actions taken in the name of Science led to a qualitative change in these programmes and their impact.[12]

The *elites* that supported this movement had in common the fact that they had directly contributed to the war effort. Some, of course, were military officers, especially those from the middle ranks who had been in direct contact with the scientists and engineers, and had been in a position to form an opinion of their methods on the battlefield or in the fight against malaria. Others were supervisors, middle managers, or captains of industry, who had served in Operations Research departments or in the field during the conflict (the obvious example here is, of course, Robert S. McNamara).[13] Then there were the inventor/theoreticians, the systems designers, the technicians thoroughly trained in science, people working in signals processing (Shannon at Bell), on new calculating machines (at IBM), in polymer chemistry (at DuPont), in aviation R&D and missile design (at Douglas Aircraft), in industrial pharmacy or agricultural chemistry. Lastly there were the physicists, mathematicians, logicians, economists, specialists in human, plant and other branches of biology, psychologists and anthropologists, each for a while immersed in the world of war, the world of solutions to be found and made to work as a matter of

urgency. The war offered them virtually unlimited opportunities to do and to invent; it freed them from financial constraints, and allowed them to scheme schemes of extraordinary scope.

These people learned how useful and effective a pragmatic approach could be when only the result mattered, when all imaginable resources were used to the full (from psychology and propaganda to logic and engineering techniques) and no appeal was allowed to any outmoded value system (such as the Comtean hierarchy of branches of knowledge) against the only valid criterion, immediate effectiveness; they learned to define their own problems and solutions, ones that were to be applied rationally even in the face of the opinion of the populations concerned; they learned, above all, the benefits of work distributed within a collectivity, of starting with 'brain-storming' sessions (within a framework of 'think tanks' and 'summer schools'), and the importance of then continuing with meticulous organization. As they did so, they developed a general pattern for action, a *modus operandi* consisting of: (1) precisely define the objective, which must allow progress to be monitored and achievement measured, (2) create a committed action group including all the forms of expertise that might be needed to tackle the problem, no means being ruled out *a priori* (not even for ethical reasons), (3) lay bare the situation in every way made possible by a combination of hardware and software, hard science, engineering science and social science, (4) find the right angle of attack and set out a procedure to be applied for finding a solution, (5) operate on a massive scale, in a coordinated way, mobilizing all available resources, (6) evaluate the results, numerically if possible, at every stage, then move to the next operation. During the 1940s and 1950s this *modus operandi* designed for war became the standard of every properly conducted campaign, whether one was doing physics, organizing treatment trials or reforming social institutions at home or in the colonies.

The invasive 'Proministrative State' (to use Brian Balogh's well-established term),[14] which was a political form of regulation based on a close association between a power centre and the experts it helped to organize into autonomous groups, was therefore to be found not only at the heart of the systems of innovation in manufacturing; it was equally at the heart of the management and reform of social relations and their regulation – at the heart of state power. This new state imposed its definitions and activities over such a wide scope for various reasons, some political (mounting conflicts, the need to enhance and rationalize the management of industrial and political systems that had become huge), others economic (the recession of the 1930s, the policies applied to cope with economic crises, Keynesianism), others ideological (the fight against Communism); but this was above all due, once more, to the Cold War: it was necessary to demonstrate the superiority of one social, political and economic system, that of the free world – and that meant developing forms of a Social State which could serve as a model. Though liberalism might be the official watchword, there was no denying the general situation: that in Western as in Eastern Europe, the lion's share of the national wealth during these years was being absorbed and redistributed by the state.

This Proministrative State is crucial if we are to understand the nature of the social compromise established at this time. In a nutshell, these years showed the characteristics of a wage-earning industrial society in full

growth – providing for a redistribution of income towards wage-earners as well as opportunities of advancement for lower social strata and an extension of social protection and integration (social security and pension regimes, principles for managing industrial conflict.). The future was bright, the outlook one of progress, and the models of consumption, education, and culture were converging. The new working class was enjoying better conditions – was becoming bourgeois, as people say. 'Egalitarian' and democratic projects redefined the main principles of a just polity in the public domain, and an 'anonymous', automatic form of solidarity, most often organized by the state, steadily replaced earlier forms. In all Western European countries the state had the legitimacy to act on a massive scale as regulator and redistributor of goods and services; within a codified framework of industrial relations, and in partnership with social groups organized and represented by trade unions and political parties, the state promoted arrangements for the defence of the weakest and an ideology of reform as a precondition for the advancement of all. This social and political dynamic benefited from economic growth and the development of world trade, and the individual became emancipated at the expense of earlier solidarities (of kinship, neighbourhood, religion). Though markets were still the prime mover in this dynamic, the state intervened far more directly than in the previous phase to correct their disturbing effects, to ensure the cohesion of social organization and drive it forward towards 'modernity'.

Individuals might to some extent free themselves from the most traditional structures of control; but these societies nevertheless remained highly structured into groups that people were subjectively very aware of (it is not, in this sense, illegitimate to say they were still truly 'class societies'); they were also very hierarchical in their functioning and values. The organization of labour, for example, followed in the footsteps of Taylor and Ford, with a clear separation of design and power on the one hand, execution and submission on the other. This top-down mode did not apply solely in business: it was burned into the very notion of the state and of its management of the social nexus. It applied to healthcare regimes, centrally run by professionals and liable to diminish responsible behaviour before long; it applied to the functioning of public administration (where the 'users' had no recognized rights) and in passive and consumerist modes of consumption – whether of material goods, offered in ever greater quantities, or of services such as education. Its counterpart consisted of the statutory and social benefits that guaranteed social protection and some mitigation of social exclusion, a restraint on income disparities, and (relative) stability of employment. Not too much should be made of this feature, however. There was real life in a movement composed of associations, sometimes guided by the representatives of organized social groups (religions, trade unions, works councils) and supported, in terms of infrastructure, by a state which was concerned to add to the collective and political mechanisms of assistance to the most underprivileged. Through such state activity there arose a professionalization of social work, a taking over and rigorous organizing of those aspects of society which functioned as guarantors of solidarity. There was accordingly an inherent ambiguity in these practices: they tended towards a centrally run, 'authoritarian' direction (even though they left the individual some real opportunities to act), but they brought definite advantages to the most deprived.

These decades also mark the high tide of a society that saw itself as composed of groups, in balance and in conflict; such a group identity was reflected in scientific thinking of the day. During the three 'Heroic Decades' (the post-war boom) the social classes were very strongly marked not only in general awareness (for example in working-class pride, in its organizations and associations), but also in the European social sciences: they were the source of very strongly felt identities, fundamental to the social and political imagination, nourishing the life of parties and embodied in people's customs, dress, and amusements; but they also had their existence through the political and social effects of the science of public administration, itself built upon the scientific constructions of sociologists and political scientists; they left their mark on statistics (the obvious use of socio-economic or occupational 'categories'), on forms of social and industrial bargaining, and on the participation of these groups, represented as such, in the running of the state.

Outside the social sciences, the process of reduction to fundamentals reached a new level. It now meant two things: first, a practical ability, developed in the laboratory, to bring to light and manipulate an extraordinary number of elementary particles (in physics) or molecules (in chemistry and biology), an ability first to measure and purify and then to rearrange and make use of these elementary units ('molecular jets' were produced, for example, and genes sequenced). This practical mastery involved highly sophisticated instruments, many practical skills (as in today's biotechnology) and very powerful tools for formal layout and calculation. Secondly, we see sophisticated theoretical constructs built on these micro-entities, theories which guided laboratory practice and so increased its effectiveness severalfold. The physical sciences manipulated (practically and theoretically) artificial, laboratory-produced materials; biology manipulated macromolecules and genes; and the industrial transcription of these instrumental and experimental techniques was present from the very outset. We find, therefore, a constant tension between the highly abstract and the utterly material, a combining of theory and calculation (through models, for instance), and an intimate link between experiment and technique; scientists moved from work on paper to work with calculation resources and then to work at the bench; there was a constant traffic between the laboratory, the standardization of techniques and the production stage, between the most abstract science, the standardized instrumentation and technical development; and one no less constant between academia, industry, and military, administrative or political circles.

These perpetual shifts from one register to another were in fact the result of different but interrelated institutions: nuclear physics in constant contact with industrial laboratories developing lasers; the tools developed by physics technologists moved across and reordered chemistry and biology (the use of spectrographs and NMR techniques in chemical analysis, of electronic microscopes and electrophoresis in basic and industrial biology); social sciences, also, were directly affected (strategic thinking, game theory, systems analysis, psychology). Industrial and military or quasi-military research laboratories were at the heart of the machine (in electronics, materials physics, aeronautics, computers, chemistry, modelling, simulation and pattern-recognition techniques; also in agricultural science, economics and social science, and urban planning). New domains (oceanography, the study of the upper

atmosphere and space science acquired through rocketry), as well as new models of social management and industrial production (organization of the ballistics programmes, the formalization of PERT [Program Evaluation and Review Technique] and, later, PPBS [Planning, Programming and Budgeting System] in management); and, lastly, whole new realms of science and technology came into being, typically featuring close links between universities and the creation of knowledge-based enterprises.

This political and economic application of science for the high purpose of the nation at war, under the strong stimulus provided by governments, was nevertheless still a business carried on primarily by private enterprise. The contradiction is only an apparent or superficial one: all through the century, and most of all during the Cold War, big corporations worked both in their own financial interests and for the higher national good. This is quite clear in the case of France, since the state itself contributed to the creation of these industrial giants (many of them nationalized), and even regarded it as its business to step in when their will faltered (the triumph of Gaullism); it applied also in Germany, where such companies acted both for their own advantage and for the national security – with the blessing and the financial and intellectual support of an interventionist federal government. It is national government policy which explains the growth of these mammoths and provides the key to understanding the period's rapid changes in technical systems (this was the case of transistors, which were made economically profitable only by a policy of steady subsidies financed from United States military budgets over a whole decade). Even today, indeed, in the all-powerful field of ICT, the state and the military are never very far from private corporations, nor the latter from the national interest; we will return to this below.

We may conclude this section by stressing one last point: though the model of the nation state, as defined from the mid-seventeenth century onwards in its dual relationship to a geographical territory on the one hand and an international balance of powers on the other (the regime instituted with the Treaty of Westphalia, now world-wide), retains all its relevance – once democracy bursts upon (or spreads across) the European scene in the nineteenth century it leads to an utterly radical transformation of the state's place in society and, indeed, in the symbolic order. This democratic irruption contributes, of course, to the gradual emergence of the Social State and its growing involvement in the arrangements for education, health and social protection; but it also helps to make this state a 'thing' in its own right, and before long a dominant one, a reality which takes its 'natural' place at the nerve centre of society. At its most extreme, it actually identifies society with the state.

The state did indeed become a managerial apparatus, a rationalizing bureaucratic institution based on scientific thinking and applying scientific or innovative policies – but it did so by occupying an area which soon involved it in providing a structure for the whole of society. The state was a modernizer, anticipating the future, arbitrating among different economic, strategic and social scenarios – and in this sense it became the embodiment of the 'social'. It did indeed take on responsibility for the country's future; it did need to be enlightened; but it was more than that: it was the Nation incarnate, the country making conscious choices, not driven at the mercy of 'hidden' forces, whether of the market or of the irrational urges which impel human action.

Thus the new State encompassed 'civil society', absorbing it while managing and leading it. So the state proves to be the realization of the Enlightenment project, the ideal of self-government; no longer 'a state' with origins in a particular historical time and circumstances, it is now the State: it is what the state always should have been, and constitutes its true essence, finally realized.

It is this 'obvious' realization, and the concomitant 'just polity' of public welfare, which found itself under attack in the last three decades of the century.

## SCIENCE, TECHNOLOGY AND ECONOMIC LIBERALISM: FROM THE 1970s TO THE END OF THE CENTURY

Two major things have changed in the last three decades of the twentieth century: first, the capacity of science and technology (above all, biotechnology) to modify the natural and human world profoundly, leading to growing social concerns; secondly, the regime under which knowledge exists and is produced, as related to economics and politics, with its attendant issues concerning the nature of globalization. We shall start with a brief look at this second aspect.

To start with, we need to recall the 'liberal globalization' which developed in the United States and Great Britain some thirty years ago and subsequently in the rest of the world (including continental Europe through the European Community). With this movement came a redefining of the roles of governments and of business and financial institutions, the rules of the labour market and of social protection, and what the political and economic elite wanted from science. This movement followed an ideological revolution whose two main protagonists were Mrs Thatcher and President Reagan.

More particularly, we may speak of a radical shift in the site of science production (from universities to businesses); of the appearance of new prospective participants; of a more organic involvement between these and the financial markets; but, more than this, of a fundamental change in the rules of the game, a deliberate change brought about by relaxing the age-old rules of intellectual property. The universities and the great industrial laboratories typical of the decades from 1900 to 1970 remain important, of course; but their mode of work and collaboration has undergone a metamorphosis, and they are now supplemented by a thousand institutions providing risk capital, and by structures of partnership among private interests, foundations and public laboratories. We may detail this modification in the link between science, the state and the market by emphasizing six points.

The first transformation concerns intellectual property: the eligibility conditions for taking out patents have been widened to a quite unprecedented scope in recent years; property rights have been granted for increasingly fundamental research prior to any 'invention' in the strict sense (domains regarded until now as belonging to public science, meaning science published in leading scientific journals). The result has been greater opportunity for market control of knowledge. It began with biotechnology (the first patent for a laboratory-designed bacterium was granted in 1980, then one for a genetically modified mouse in 1988; this has now reached the point of patenting DNA

sequences, whose potential application is extremely ill-defined); it has since spread to many other fields, from software to electronic databanks and management methods. This change in patent law has had a decisive impact on the definition of the scientist's social role, on the relationships among knowledge-producers, the market and property rights, on the way knowledge itself is produced – in short, on what kind of an institution science is, or should be, in terms of what is common and what is private.[15]

There are many legal authorities who speak in this connection of a new 'enclosure movement', by which they mean that this kind of law allows a privatization of 'common assets of the mind' (public science) corresponding, many centuries later, to that of the 'commons' or collectively held land in England at the start of the modern age. That movement led to a redistribution of wealth, which had devastating effects on large swathes of the population but was justified by the considerable growth it made possible in overall productive capacity. The extension of private property motivated the new owners to invest, and reduced the chronic over-exploitation of the land. The question now is whether the same process may be expected today – and what the cost will be for the losers.[16]

This first change in the rules of the game in the world of knowledge production was accompanied by a second: it meant a growing number of universities became directly involved in industrial development, increasingly abandoning their role as providers of 'open science' (to use an economists' term indicating academic knowledge as a public asset),[17] and actively participating in the lodging of patents and in exclusive licence agreements on their results, made with businesses of their own choosing. In the United States, the basis of this movement was the set of laws known together as the Bayh-Dole Act (in reference to a major bill passed in 1980), authorizing universities to patent their productions, including those generated with the use of public funds. This movement was growing in the same period as the change in patent policy, was based on the same arguments and was propelled by the same enthusiastic doctrine (that private ownership was a guarantee of greater effectiveness). It led to a vastly different process in the production of knowledge (lawyers become central characters in science and served on the staff of universities) and to conflicts of interest, unknown thirty years before, among different participants in the Science business.[18]

A third aspect that complemented the last and also concerned the transformation of universities was the penetration of many of them by big industrial groups which invested large sums of money in exchange for a privileged position in acquiring the science and know-how produced there: not a few industrialists have endowed university laboratories (or created entirely new ones with lavish foundations) since the end of the 1980s. Encouraged to renew themselves (read 'to bind themselves to the business world', and in particular to accept such offers and the partnership constraints they implied), a great number of universities changed their rules in this direction, and to a large extent, in doing so, changed their nature.[19]

Fourth, as a sequel to this, the last two decades have seen many businesses giving up some of their in-house investment in basic research, and bringing such research more directly under their Development divisions, reducing its independence and freedom of action. This 'Japanese model' was conceptualized in Europe in the 1980s, where it

centred on industrial innovation rather than 'science' (a picture which had great credibility at the time), and the need for quick returns in circumstances increasingly dominated by financial capital led to abandonment of the earlier model of development with its weaker short-term constraints. At the same time public financing for R&D was fairly static or even declining in the 1980s and part of the 1990s: this tendency also was driven by the rampant liberalism of the time, but has generally been reversed today (when the economy is in trouble, governments are always called to the rescue).

The fifth thing to be taken into account is the fully fledged market in science and research subcontracting that grew up over these years, the greatly increased number of new businesses set up on the basis of a laboratory-developed technique, procedure or type of product with high scientific value (this applies particularly to biotechnology and communication electronics) and the net growth in numbers of consultant scientists called in as 'problem-solvers' or providing specialist services to other businesses. Under the impact of the Cold War's end and the political drive for deregulation, all those involved have changed (some radically) their strategies, their forms of involvement and their alliances. In this sense we may say that the research economy is undergoing a major mutation. It has now spread, its internal balance has been transformed, and it has colonized areas previously less dependant on it.[20]

The last point is that there has been no uniform wave of change, moving forward at the same pace everywhere, no well-defined evolutionary front neatly distinguished from its antecedents and applying to the whole world of science and industry. There are large differences between fields; differences also, quite clearly, between countries (the phenomenon is less marked in continental Europe than in the United Kingdom). Innovation continues, for example, to be essentially incremental in origin in the capital goods sector and in aviation, while the pharmaceutical and ICT industries, which employ the most graduates, have multiple channels linking them with academic research and in some cases have developed major in-house divisions for fundamental research.[21]

What are we to conclude from this? That a change is under way in the regime of production, certainly. Historically, 'open' science (that which circulates freely in publications, and is connected with the idea of the public good) and 'private' science (whose results belong to its producers) had been conducted side by side within the framework of the nation state – and it is this balance that has now been called into question. Scientific knowledge is indeed mobilized by industry and the armed forces, but the tendency towards private appropriation had until now been counterbalanced by the social compromise which makes the nation (and the public good) a primary value. University science, technical knowledge and industrial know-how each had their own rationale, but they were mobilized by the great Leviathan, each in its place and in order of battle. And the state kept the emphasis on standards transcending any 'excessive' scope for private property. Symbolically, Science belonged to a protected realm, its core being in institutions whose products were not, as a general rule, liable to become private property. Elsewhere, the great industrial laboratories produced knowledge, often quite fundamental knowledge, that was essential to their business; but even this was very

widely distributed. Many university scientists likewise took out patents between 1900 and 1970; but many of their techniques and results were made public, these patents not leading to the formation of entire domains of research which were 'off limits', as happens today.

It is a shift in this balance that we appear to have been witnessing these last twenty or thirty years. Under the influence of the liberal revolution and the transformation of society, the regime for the production of knowledge centred on academic institutions, and the public welfare values it traditionally upheld has found itself opposed and challenged, to the benefit of the private production of technological and scientific assets. There seem to be fewer means of opposing the rules of the market; and the trend is facilitated by the very nature of the science/technology and the products it develops, especially in the life sciences; it is facilitated, also, by current political and social transformations which affect the value systems and legal framework informing research and invention. Patent legislation has been decisive here: by widening the scope of what could be patented, it was the principal means by which the world of the market managed to shift the previous balance and make marketability the predominant or even the only effective standard. Following the events of 11 September 2001, the United States is once more on a war footing; but this does not mean that the tilt towards a world economic order based on private science need be questioned – though it will have greater support from public funds.

## By way of conclusion: science, risk and democracy today

There is no denying that Western Europe at the end of the twentieth century was marked by lively social concern about science and technology. This situation came about for three main reasons. The first is that science, or more precisely the world of technology and industry to which scientific knowledge is organically linked, has the power to alter our lives in radical and irreversible ways. We need only think of the great global equilibriums (greenhouse effect, holes in the ozone layer, climate change, the environment generally), nuclear technology and the waste issue, industrial accidents such as Bhopal, or, above all, biotechnology, artificially assisted human reproduction, the introduction of genetically modified organisms (GMOs) into the food chain, the possibility of human cloning – and the list goes on. A principal feature of this technological/scientific industry is that it cannot predict, before actually applying its knowledge, all the consequences that might result: in other words, what exactly is altered or displaced by its intervention only comes fully to light after the event.[22]

A second cause of concern have been the crises or scandals that the European countries and indeed the whole world have witnessed over a number of decades and which have made a lasting dent in public confidence in the social and political regulation of science and technology (the AIDS epidemic and the blood transfusion scandal in France, the carcinogenic effects of asbestos, mad cow disease, Chernobyl, the lack of transparency in bringing GMOs onto the market, air pollution, dioxin). Such events have led the victims to refuse to be satisfied any longer with compensation measures, but to demand that criminal law be applied to such matters. This change in public attitudes is broadly related to the social changes in our societies, not least the emergence of better-educated groups that have risen with the new economy and have a different idea of the social nexus and the place of ethics in regulation. The events mentioned above, arriving one after another to generate strong feelings and extensive media reporting, have led to a heightened sensitivity about the procedures and products offered by industrial science and technology, and even to demands for moratoriums and other forms of risk management.

The third reason we may offer for this disenchantment is the fact that responsibilities nowadays appear less clearly articulated: there is a blurring of the boundaries between the various authorities whose task is to guarantee that a proper watch is kept. In Europe this is due to the growing role of the European Commission and the nature of its power (superimposed on the role and power of national governments); and on a world-wide scale it is due to the rise of bodies which, though unelected, nevertheless make rules and regulations that increasingly govern the lives of individuals and nations (such as the WTO); it is due to the growing power of the judiciary (also unelected) in its many manifestations – in short, to the fact that the regulatory powers of the ordinary democratic authorities, those of the nation state, have been drastically eroded.

These are decisive issues, and deserve to be examined and debated in depth – and these debates take place in Europe. We do not disparage the role that experts and scientists should play in such discussions (a central one, almost by definition), but the issues at stake are such that they cannot be the only participants, or the only arbiters. 'Technoscience' and the industrial world linked to it are indeed capable of transforming the natural and social worlds so radically that the issue becomes a thoroughly political one. This is no anti-science demand, but an expression of the will of societies which are both increasingly literate in science and increasingly desirous of controlling their own destinies; and it would be wise to respect such an expression by democratic means. Let us be quite clear: this desire – that society as a whole should be in control of the potential developments offered by science and technology – is not a negative one: in no way does it amount to a denial of the role which science can play. On the contrary, it carries a rich cargo of expectations; and the skill of knowing when and how to intervene is something we all need to learn.

To do so, we need to take three things on board: (1) these new issues arise outside the well-controlled domain of science itself, and can therefore definitely be expected to lack any single or unequivocal solution. Here science is tackling problems it can only imperfectly know (and it needs to learn that there are plenty of things it does not know); (2) these problems are not purely intellectual: they inherently encompass technical, industrial and financial issues and it is therefore mandatory to admit the existence of identifiable interests in the choices made (science does not live cut off from the world in an ivory tower); (3) there are many paths our future could take: they differ according to the degree of civic commitment shown by individuals (the future they want, for themselves and their children) and these individuals' estimates of our capacities, as a society, as scientists, to bring such futures about. Again, the best way of handling this is by as public a debate as possible, without pretending that scientific knowledge alone can settle such issues. With such modesty, science

could speak to great purpose, helping to clarify the alternatives and not, we could then legitimately hope, triggering a violent rejection.

## THE HISTORY OF WESTERN EUROPE SINCE 1914: CULTURAL DEVELOPMENT

The 1914–1918 war, which later lost its unique status and became known as the First World War, was to its contemporaries and above all to its survivors, the Great War. In the historian's mind, it still is. From it there emerged a culture turned upside-down by the violence, individual and collective, that had been unleashed by appeals to the masses and by the systematic recourse to propaganda.[23] Ever since then, culture has been haunted by suspicions about the fragility, the questionable authenticity or the irreversible decline of the values that had held sway before the struggle; there are doubts for the future of the rationalist, humanist and liberal West. The twentieth century was to bear the marks of those doubts, whether we consider it only up to 9 November 1989 when the Berlin Wall came down, or follow it further.

From the Great War also emerged a 'Western Europe', clearly distinguished for three-quarters of a century from another cultural world that consisted at first of the Soviet Union on its own (alone, but considerable) and was then extended by the Second World War to include all the 'countries of the East'. Though distinct from these, 'Western Europe' nevertheless did not lose its main points of difference from the cultural choices of the United States, which had from the start been dominated by a stronger idea of private agency, more business-friendly and less centralized. An in-between geopolitical situation also reveals this part of Europe developing independent cultural experiences of its own which were deeply foreign to the predominant liberalism, most of them harking back to an authoritarian tradition brought more or less up to date; the most visible of all these brought a fundamentally novel choice, the newly forged concept of totalitarianism.

When we look closer, though, we find we cannot reduce the way a society's culture functions to purely or even essentially political determining causes. The economic situation, with its alternating phases of growth and depression and its often massive social effects, cannot help but deeply influence the symbolic issues of concern to the groups of people involved, as the century's last quarter well illustrates: as cultural changes go, the fall of the Berlin Wall was no great turning-point, but must take its place in a long, continuous *fin de siècle* that can be characterized as a widespread movement of questioning or even challenging the progressive values that had been dominant during the previous period. Looking more closely still, it becomes apparent that we need to examine technical developments first, in that it is these which give any age the particular framework for its practices and ways of representing the world, though of course that framework is not, as some early theories of communication science maintained, a mere transcription of them.

We may divide the years into three major periods, each clearly identifiable: a world war period (including both wars, and the years between), then a time of growth, corresponding to what the French sociologist Jean Fourastié[24] called the 'three Heroic Decades', and lastly a *fin*

*de siècle* which is still continuing, in a world which now has to face the effects of the historic events of 11 September.

## THE WORLD WAR PERIOD

The period from 1914 to 1945, dominated by the culture of war, was of course a time of great crisis that went beyond the direct effects of the two wars; but it was also a period shot through from end to end (partly because of this war situation) by a radical upheaval in technology, whose effects were in sum beneficial though this was not immediately clear to the collective awareness.

### 'Technical reproducibility'

This formula was first coined in intellectual discussion by the German philosopher Walter Benjamin in 1936.[25] Since his exile to France (fleeing Nazi anti-Semitism), he had been led to reflect on the status of works of art in a society that would from now on be governed, or even regimented, by this new capacity of the culture's technology to reproduce the same work *ad infinitum*. This promised widespread availability and a certain 'democratization', while at the same time threatening a loss of individuality. Other thinkers, too, noted the problem, though they did not put it so theoretically, systematically or forcefully. Some were optimistic (Jean-Richard Bloch), others pessimistic (Georges Duhamel); and of course the phenomenon was not new. Without going back as far as the invention of writing, nor even to that of printing, there is no doubt that the nineteenth century, from the lithographs of its beginnings to the movies of its close, saw a noticeable acceleration in the tendency. Nevertheless it was this world war period which saw the widespread use of the three techniques that make it the first fully audio-visual age, at least in the modern sense of the term: photojournalism, wireless broadcasting and, to top them all, the talking movies. This period ended with the definitive arrival of the major cultural diffusion technology of the next: television, whose first broadcasts had actually been made in England at the end of the 1920s.

Photography, so far confined to luxury publications and an occasional appearance in the popular press, now came to the fore; in the end it dictated the layout of the mass dailies (*Paris-Soir*) and the illustrated magazines for adult readerships (*Berliner Illustrierte Zeitung*)[26] and for young readers (the *Winckler* and *Del Duca* titles, all either translations or imitations of American comics). In the form of photomontage, it became a propaganda tool regarded as particularly effective in the installation of the great, spectacular exhibitions in which this age so delighted (e.g. the Exhibition of the Fascist Revolution, Rome, 1932).[27]

'W/T' (wireless telephony) proved during the Great War that it could do sterling military duty; once peace returned, it was able to reach a wider public in the form of scheduled programmes which were, depending on the country and the date, run by private enterprise or, increasingly, the public sector, until in a number of countries a monopoly of broadcasting was established. What this meant varied, of course, depending on national conditions, which ranged from a liberal country which insisted on the

independence of the central broadcaster (the British Broadcasting Corporation, or BBC)[28] to a totalitarian regime concerned to ensure a wide uptake of this ever-available conditioning tool that penetrated the whole country, household by household (at the instance of the Nazi state, a People's Wireless was mass-produced and sold at an easily affordable price). On the eve of the Second World War, in which such resources were used systematically by all belligerents, the number of receivers (now called radios) ran into millions in countries like the United Kingdom, Germany and France; so did the numbers going to the cinema, which had been offering talking pictures since the early 1930s.

### Crises

Just as the rise of the silent movies had dealt a fatal blow to a whole genre of popular theatre (often at fairgrounds), so did the even faster spread of the 'talkies' permanently alter the theatre of the middle classes (known in France as the *théâtre de boulevard*), whose plots and actors moved wholesale to the big screen. This cultural shift coincided with the direct effects of the economic crisis that went back to 1929, which by considerably impoverishing the sources of private commissions gave a hard knock to architects and artists as well as live entertainers. There is no doubt, though, that the real problem was one of production and distribution, not of creativity.

The growing mismatch between the education systems set up in the previous century and the social and industrial requirements of a world now dominated by industry and urban interests brought new issues to the fore, and new dissatisfactions. Mass schooling in the form of free compulsory primary education had been achieved in northern European countries, and was well on the way in others; France and certain other countries had added an aspect of ideological modernity (the exclusion of religious matters) that prevailed in the end. However, this solution could not cope with the new problems posed by the self-sufficient but marginalized nature of strictly technical training and by most primary school leavers' lack of access to secondary or, consequently, advanced education: both were still generally reserved for those privileged by wealth or status.

Educators who wanted to modernize teaching methods in a liberating spirit (Maria Montessori, Célestin Freinet), or to lower the barriers between one kind of schooling and another, were for the most part preaching in the wilderness; and the number of teachers in paying institutions were by no means on the increase in all countries over the whole period.[29] The middle and upper classes did, on the other hand, warmly embrace the rapidly expanding Boy Scout and Girl Guide movements, as soon as their methods won over the secular-minded and, above all, the Catholics (despite these movements' Protestant origins). Moreover, all three persuasions also made common cause in organizing activities to enrich the leisure – and the minds – of children and adolescents from the working class: 'youth' became a social entity in its own right, thanks to these ideological strategies; and where they led, the market gradually followed.

The practices arising from this coincidence of vigour and misgivings naturally enough combined eventually in the emergence of the hallmark adjectives of the age: 'mass' (in social terms) and (in politics) 'total'.

### Mass culture

Mass communication media helped strengthen the identity of nation states by speeding up the spread of the centre's ways of doing things and thus its particular values, from a uniform language to common historical myths; but the same cultural technology also tended to weaken national boundaries, and to encourage genres and lifestyles of American invention to take root in those countries most open to outside influences. Thus popular music was subjected to strong influences from the arrival of the first (black or white) American jazz bands in 1917 onwards. First jazz and then swing established themselves in the public ballroom, before more gradually taking over the popular song. They stayed quite separate, on the other hand, from the world of art music, which paid them only the most passing and superficial interest in the early part of this period and then moved off towards other horizons; it was not until just before the Second World War that a small minority of young amateurs laid the foundations of a new art form in alliance with the – likewise fragmentary – movement of the early cineastes, which dated from the 1920s. Similar American tendencies affected the printed matter aimed at young readers in these same countries (France, Belgium, Italy and others); this material seemed destined, just before the war, to align itself with the graphics and narrative patterns that were 'made in the USA'.

Beyond these tendencies which lend themselves to geopolitical explanation, the general development of what was beginning to be called 'mass culture' was driving a standardization of collective habits of symbolic representation in all urban or urbanized societies, in a dialectical association with the copy-cat practices of great numbers who followed the cult of 'the star', a cult all the more strongly established because the star could now be seen and heard everywhere, on cinema screen and radio set. This association of extreme numbers and supreme distinction applied both to the world of the music-hall and that of the cinema at their respective zeniths; and also to that of sport, which was still at the start of its dizzying ascent.

Sport had made its appearance, among the elite, around the middle of the previous century; little by little it had won over the working class, through particular activities which combined social occasions with physical exercise (cycling) or brought spectators together in a stadium to watch an exhibition of physical prowess (athletics), often including team spirit (football, rugby).[30] This evolution can be followed in club memberships and in the rise of the Olympic Games, which imperceptibly took on the status of a political prize of the first order, both for the country of a successful competitor and, above all, for the organizing country (e.g. Berlin, 1936).

### Totalitarian culture

Right-wing totalitarian 'fascist' regimes that were partly the product of this social trend to mass behaviour became established in Italy after 1922 and in Germany from 1933, as well as giving a more or less long-lasting tint to the

political and cultural life of as many as ten other countries, from the Portugal of Salazar's *Estado novo* to the lands subject to Axis domination during the Second World War, and including also the Spain of Generalissimo Franco. These pushed the opportunities for increasing uniformity to their most extreme consequences, for they were also opportunities that helped recruitment to the movements themselves. They took cultural issues very seriously, and were not prepared to leave them to the free play of market forces or of voluntary associations; they invented an arm of government that became increasingly ambitious in its proclaimed scope and increasingly interventionist in its methods. In Italy, for instance, a simple Bureau in charge of monitoring the press grew over a decade into the vast Ministry of Popular Culture, itself only a small version of the government department that Hitler entrusted to Joseph Goebbels in 1933, with the official remit of popular 'enlightenment' (*Volksaufklärung*).

This project led to the systematic turning of all forms of cultural expression into instruments of one purpose: the service of the totalitarian state, the single Party, and their supreme Leader. Architecture and sculpture produced buildings and allegories of colossal size (the Olympic Stadium at Rome, the Berlin Chancellery); music, dance and gymnastics mobilized uniform bodies; the cinema provided sublimity and sublimation through spectacle, whether the ostensible genre was documentary or fiction – indeed, the boundary between the two was kept arbitrary (e.g. in the case of Leni Riefenstahl).

All the same, we should not exaggerate these dictators' obsession with propaganda; they were also careful to give 'pure' entertainment its rightful place, as long as it served the regime's interests by cultivating nationalism and racism, or the cult of authority and heroism. The essential thing was to produce mass behaviour, and to justify devotion to the regime by the quality of the public service rendered, which entailed demonstrating to all ages and all classes the admirable activities of youth and leisure movements such as *Dopolavoro* or *Kraft durch Freude*.

We may well imagine how the forms produced under such strained conditions betrayed corresponding tensions between the forces fighting for order and those defending the established disorder.

## Revolts and revolutions

It is no exaggeration to see in the most radical avant-garde movement of the years immediately after the Great War (provocatively self-baptized 'dada') a direct product of the war itself, both because the movement was born in the middle of that war (and in a neutral country, Switzerland) as an avowed reaction against it, and because at bottom it offered, in its intransigent rejection of established modes of expression, a transposition of the violence of war to the cultural plane. But dada, too, had its antecedents (it extended the provocative methods of futurism) and its successors, giving birth to surrealism in the person of its main disciples, beginning with André Breton, who was joined later by the very founder of dada, Tristan Tzara.

Surrealism's course and fate is illustrative of its whole age: it took shape in the mid-1920s, at the heart of Western Europe as the region began to find its way back towards prosperity and dreamed of international peace assured by the League of Nations, while still unable to recover entirely from its wounds. Here surrealism systematically positioned itself as an organized subversion, freeing the forces of the imagination.[31] It can be seen as a resurgence of romanticism, but this time deeply alien to national feeling; this made it, in a few years, a real international movement, whose effects could be detected from Paris to Belgrade. As the surrealist creed also refused, at least in theory, to recognize the boundaries between the arts or any hierarchy among them, those effects made themselves felt in literature as much as in the visual arts; and here they lasted well beyond the 1930s, when the movement, as an organization, dissolved in schism.

The obstinate attempt of the Breton group to identify its own struggle with that of the Leninist avant-gardes – first Soviet, later Trotskyist – was a political failure; but it illustrates well how these tendencies must be understood as a single whole. And indeed it is as a single whole that their enemies saw them, including those who came to reject (as *kulturbolchevismus* or 'degenerate art') even those other movements that challenged the cultural order inherited from the nineteenth century: continuations of earlier aesthetic revolutions such as abstract art, and, still more recently, the collective endeavours to establish an atonal aesthetic in music (the Vienna School around Arnold Schoenberg), or a vitalist body language (German contemporary dance), or again a functionalist architectural and visual environment (the Bauhaus school). All these trends shared the determination to free themselves from all reference to heritage; they would also, with surrealism, prove later to have been particularly fertile; later, and at the very heavy cost of open persecution by both the Nazi and the Stalinist totalitarian persuasions, they were carried away by the efficiency of the parallel and contemporary return to order.

## Return to order

Immediately after the end of the Great War voices were raised, even among the younger cultural generation, advocating a return to the values of reason and clarity, claiming to oppose some earlier cult of decadence which was more or less associated with symbolism; in a context such as that of French culture, these voices found themselves in harmony with certain stereotypes of the national identity (Jean Cocteau, *Le coq et l'arlequin*). It was the strength, but at the same time the limitation, of such a position that it tended to produce an aesthetic which kept its freshness by means of an artful simplicity: the music of the Groupe des Six is a good instance. One might say the same of the acclamation that greeted the emerging literature of political witness, its authors invested with the image and often the role of intellectual hero, whether their values were of the right (Ernst Jünger, Ernst von Salomon), of the left (Erich-Maria Remarque, André Malraux, Paul Nizan) or oscillating from one to the other (Pierre Drieu La Rochelle, Curzio Malaparte).

As time went by and the economic crisis chafed deeper, with rising danger on the international scene, the tendency turned more and more clearly reactionary. Individuals and groups who still championed traditionalist values (religious or otherwise) were accordingly joined by others coming back into line, whether from the direction of the mild

modernism prevalent just after the war or indeed from among the avant-garde itself, from Giorgio di Chirico to Igor Stravinsky, including the former surrealist Louis Aragon, who made himself the high priest of socialist realism in Western Europe. In architecture, sculpture, painting, the decorative arts and music, neoclassicism was pre-eminent in both public commissions and general approval. It prospered all the more because its flanks were covered by a whole literary and artistic industry that either claimed it was championing European authenticity or, in the same conservative spirit, cultivated exoticism. Exoticism, indeed, was suited to the colonial supremacy that reached its high-water mark in this world war period, and was to ebb so quickly thereafter.

This great Return to the Past had its (apparent) triumph in Europe under the Axis powers in the early 1940s, when Antonio Ferro flourished in Portugal and Giuseppe Bottai in Italy, where the futurist element seemed thoroughly vanquished by academic tendencies. Nor was it absent from the deliberately jingoistic, traditionalist attitude of the whole Resistance culture. Later on, though, it became clear that the defeat of the Axis would have the effect of utterly destroying its legitimacy, for a whole generation.

## THE TURNAROUND

We find the technological potential of the earlier period rediscovered after 1945, but with a thorough-going change of direction due to a radical reversal of the macroeconomic situation.

### New audio-visual drivers

The period made no great fundamental inventions in terms of communication technology: but in this field it is not invention which counts so much as the diffusion that ensures that a technology becomes part of the collective endowment. Just as these decades saw not the invention but the popularization of the automobile (one generation later than in the United States), so in terms of cultural media they witnessed less in the way of qualitative shifts but more in the way of great extensions of quantity, often so dizzyingly great as to amount to the breaking of new ground. Gramophone records, for instance, now came within everyone's reach thanks to the development, at the end of the 1940s, of recording and duplication techniques that made them much less fragile and expensive, utterly transforming the mode of transmission of new popular music styles and, we should not forget, the means of general access to the heritage of so-called classical music which until then had been available only to the concert-going public.[32]

Developments in radio were of the same order, as soon as transistors made much smaller sets generally available during the 1960s; these made listening a more flexible and increasingly gap-filling activity; there is no doubt this was related to the shift in programme style towards the modern dominance of music and news. The change in radio's status was at least equally due, however, to the emergence of a competing medium, television. This, though it did not kill sound broadcasting as some had initially expected – any more than the cinema killed the theatre – did take over some of its functions.[33]

Television broadcasts had been restarted straight after the war in the United Kingdom, and a decade later it had already become a mass medium in that country, through the adoption of a technical standard inferior to the French one. The French option, taken essentially for protectionist reasons, meant that mass penetration took a decade or so longer in France, while the countries of southern Europe had to wait until the end of this period to reach the same stage. Nevertheless, from mid-century onwards all observers recognized the general trend. There has been considerable discussion about the immediately inferred connection between the rise of TV and the simultaneous sharp fall in cinema attendance in these various countries. The relationship was not in fact automatic, as some timing differences in certain countries show (Italy, for example); the spread of car ownership, and the resulting new ways of spending leisure time at weekends, also had a great part to play; but the new forms of entertainment the small screen offered, including films broadcast by or made for TV, did in the end depress cinema attendances, especially once TV could offer colour; and the arrival of the VCR confirmed the trend.

Here again, though, we should really consider a period's cultural equipment as a coherent whole rather than concentrating on any single, supposedly dominant medium. When we do so, we are struck above all by the convergence of the new audio-visual configuration's effects as a re-focusing on individual consumption in private spaces; on the other hand, we must also take into account the simultaneous rise in a number of public, collective cultural practices in other fields: proof, if proof were needed, that sociological cause and effect are never unequivocal in nature.

### Growth

A large portion of these collective practices, or at least of their development, can be attributed to the period's main driving force, which was the economic phenomenon perfectly captured – fuzzy edges and all – by the term 'growth'. Visible in a whole series of indices (output, productivity, trade), this resulted, thanks to the general adoption of welfare state policies, in a thirty-year unbroken rise in incomes for all social groups and, in most countries, a reduction in income inequalities, as well as a decrease in working hours (both official and real) and at the same time an increase in paid holidays. Western European consumption practices were moving away from the satisfaction of basic needs, and a growing share of both money and time came to be spent on cultural purchases; this was confirmed by the new statistics on cultural activity which began to be gathered as a sociology of leisure became established.

Growth applied to cities and towns, also. People's personal ties to rural societies weakened all the more rapidly as those societies were losing their vitality, so as to engender, by the close of the period and in tandem with spreading urban frustrations, a considerable nostalgia for a rural way of life which by now was largely imaginary. The suburbs became the predominant feature of urban agglomerations, and observers and associations alike applied themselves to the needs, real or supposed, of their inhabitants. The combination of large-scale urbanization and the widespread

European emphasis on voluntary public action generated a theory and practice of cultural activity, which greatly added to local resource endowments, from public libraries to multipurpose cultural centres.

The extrapolation of these indices also had a lasting effect on the actual content of the culture transmitted: ideological confrontations, far from diminishing, were simply translated into a conflict of optimisms, as the supposedly dominant culture came under increasing attack for its 'materialism' and the inadequate pace of equal access to cultural resources and cultural expression. This critique crystallized, again towards the end of the phase, in the May 1968 movement in France and similar upheavals in public opinion in the other democracies.

## Hot and cold

Beneath the surface of its political demands, the protest movement derived part of its force from its increasing and strictly cultural aspiration to less authoritarian or even avowedly libertarian conceptions of sexual and gender relationships and the functioning of the family as an institution.

## Liberated behaviour

While the media talked, from the mid-1960s onwards, of a permissive society, quoting examples from Scandinavia or the United Kingdom,[34] statistics show that the same years also saw the start of a major demographic shift that traversed Europe from (roughly) north to south, with parallel and frequently correlated falls in marriage rates, birth rates and fertility rates as well as increases in divorce, cohabitation and single-parent families. The return of liberal democracy in Portugal, Greece and Spain allowed those societies to join this general trend, which in all countries took the same institutional and symbolic forms and for which the term 'cultural revolution' is really no exaggeration.

The cultural productions of the age, from social science to the most popular forms of art, bear witness in the closing years of this period to the successive toppling of taboos which the modernism of the immediate post-war years, whose priority had been the great collective labour of reconstruction and then expansion, had hardly touched, so far as the great mass of the population was concerned: taboos that upheld a male-dominated, patriarchal, heterosexual and matrimonial pattern in private life. Alongside literature and the cinema, a whole world of popular music, mainly American or British in origin or at least influence, from rock'n'roll to pop music, helped to spread a more hedonistic view of the world, increasingly critical of established institutions.

## The Cold War

In the end, all the promise of this entire movement made the period forget just how starkly, in ideological terms, it remained overshadowed until its end and even later, by a deep bipolarity which could be felt not only in its geopolitical affairs but also within its intellectual debates and, accordingly, its cultural productions. Belonging, as by

definition it did, to the Atlantic world, Western Europe had been the first and foremost site of crystallization of a critique of totalitarian culture which was expressed in such identity-defining instances as the meetings of the Congress for Cultural Freedom, reviews such as *Preuves*,[35] and works such as those of George Orwell or Raymond Aron. Every indication, however, was that Marxist influences, though confined to a minority presence in public opinion generally, retained until the very end of this period a predominant role within the intelligentsia, at least in those democracies where such an intelligentsia played a considerable role, such as Italy or France.[36]

In a situation that lent itself to partisan commitment from start to finish, and was in a sense a continuation of the world war by other means, Western consciences found subjects of polemic and occasions for public witness in abundance. The threat to the future resulting from the deployment of nuclear weapons by the two superpowers gave rise to a pacifist movement, at the outset strongly influenced by the Soviet Union. Imperceptibly another issue, closer to home, took over: decolonization, affecting especially the United Kingdom and, still more, France, which was more attached than the United Kingdom to the idea of colonization as integration. At last the process was transposed to the case of Viet Nam, and large swathes of the European intelligentsia joined in criticism of the United States.

The privileged position left vacant by German philosophy, once the leading influence but virtually annihilated following the disaster of 1933, came for a generation to be occupied by France, with reviews such as *Esprit* or *Les Temps Modernes* and the emblematic figures of *l'engagement* such as Emmanuel Mounier, Albert Camus or Jean-Paul Sartre. Sartre's influence, indeed, went beyond the boundaries of that generation, due to his ability to pronounce on all the main issues that concerned the next, as well as being the companion of Simone de Beauvoir, whose *The Second Sex* came to play a seminal role in awakening feminist consciousness around the world.

The emergence at the heart of the debate of what a French demographer, Albert Sauvy, suggested in the 1950s calling the Third World for a while gave particular prominence to those who spoke on this subject (Aimé Césaire, Frantz Fanon, Jean Rouch).[37] Most of the time, however, it was to the intellectual issues internal to European cultures that the main critical works of this period referred, whether artistic such as those of the iconoclastic French or Italian film-makers from Jean-Luc Godard to Francesco Rosi or Marco Bellochio, or intellectual such as those of the philosophers and essayists who, though they could be as different from each other as Ivan Illich, Michel Foucault and Jürgen Habermas, nevertheless did agree in rejecting conformity.

Frequently it is in critical projects of this kind that a period's most representative works are to be found; such projects are positioned, by their authors and by their commentators, in the avant-garde of European cultural production.

## Avant-gardism

Never has this military metaphor so flourished as during this age, fundamentally determining the behaviour not

only of creative people but of their interpreters and their various audiences as well. The post-war years saw the return to grace and the critical and official triumph of the great inventions of earlier generations, from abstract painting and sculpture to atonal music, and including the Bauhaus,[38] which returned to Europe reshaped by the prism of America but quickly seized on as remarkably well suited to the new urban projects. Some of these masters of the new modernism enjoyed a reputation that was, to be sure, restricted (Le Corbusier, Olivier Messiaen) but others ended by becoming popular (Pablo Picasso) and having a profound influence on the new generations.

Far from the limelight, younger artists began to introduce more socially acceptable forms of earlier 'outrages', and with some success, for example in the great town planning programmes, especially in northern Europe, by applying a new, more functionalist conception of everyday objects ('design') making much of Scandinavian and Italian models, or with an electro-acoustic music which in a short time considerably enhanced the available palette of sounds. The 'new novel' rather quickly became unfashionable (though it left enduring traces in academic theory), but the new wave in films captured a wider audience with its aesthetic of slimmed-down resources and ambitions, which by no means ruled out a great sophistication in the results. The critical and commercial success of this group can also be accounted for by technical and economic developments: the formal choices of the new wave corresponded perfectly to the new tools of film-making, while they made themselves attractive to producers by costing less.

This more or less subtle interplay of formal and social forces illustrates the general trend of radicalism; and 'radical' pretty well summarizes the period as a whole. It can readily be seen in a field like the visual arts, where dislike of figurative expression was combined with a re-examination of media, first depriving canvas and paper of their supremacy, and then undermining the conventionally tangible object, and ending with more or less ephemeral manifestations such as the Happening, or conceptual art.

### The death of fine art

In this way, by the time this great, thirty-year progressive trend had run its course, the legitimate arts had turned into so many formal extremes, from land art to Pina Bausch's minimalist choreography; and, no doubt, extremities: things it would be hard to exceed. However, the appearance of pop art at the end of the 1950s (on British soil) reminds us that one form of radicalism was to integrate the vernacular, to assign the so-called minor arts a somewhat less humble place.

The old system of aesthetics, based on a clear distinction between major and minor arts, fine art and decorative arts, or more generally between art and craft, had in fact preserved its coherence and elitism well into the years following the Second World War: we find forms of expression stigmatized as 'popular', 'utilitarian' or 'recent', as the case may be, and in all European countries these were still absent from the prime venues that conferred artistic legitimacy, or at best given only a marginal showing within them. Songs, improvised music, fashion, furniture, photography and film often still had no dedicated institutions to protect and champion their heritage, to

train their professionals, to spread their inventions and to discuss their theory.

The post-war years saw a proliferation of such institutions, often on the initiative of small groups of amateurs who gradually built up a network influential enough, though in some cases only after many years, to persuade the public authorities of the usefulness of what they were doing, and to get financial assistance and official recognition. One of the first to benefit from this trend was the cinema, where much was at stake for the national economy: film libraries were endowed, whether public (the British Film Archive) or private (Cinémathèque française); schools (Centro Sperimentale, IDHEC) and networks of excellence (film clubs, art houses) were founded, as well as critical reviews (*Les Cahiers du cinéma, Positif, Bianco e Nero*).[39] The chronology of this process shows that the construction of this new legitimacy coincided with the more or less complete elimination of the delay between the production of the most innovative work and its institutional recognition, as shown, in particular, by public commissioning and acquisition policies. When the slump came at the end of the century, this two-fold recognition proved able to withstand all retrograde forces.

### The *fin de siècle*

In some ways the period starting with the crisis that was at first called just the 'oil shock' of 1973 might have been a simple return to the depression climate of the 1930s; but the mid-1970s can also be seen as a unique period, now that we appreciate the simultaneity of the fall of Saigon (the high-water mark of Leninist expansion) and the publication in the West of *The Gulag Archipelago*, the first spectacular sign of the upheaval that would vindicate it less than fifteen years later. We need only look at the cultural clues to realize that there was indeed a '1975 Revolution' which marks the arrival of a new world of constant economic malaise associated with an evident acceleration in the freeing of the energies of the individual. This apparent contradiction did not fail to produce ambiguities in its effects on symbolic representation.

### The PC

Viewed from a little distance, the period seems dominated by the primacy of television, measured by some in terms of the growing number of sets, though the number of channels was at least equally significant; the latter was considerably extended by the ending of public broadcasting monopolies and by the appearance first of cable and then of satellite transmission. Widespread ownership of VCRs opened the door to a new way of using the small screen, imperceptibly transforming the television viewer into a schedule producer. If we consider this new domestic apparatus in conjunction with the replacement of the amateur ciné camera (8 mm, then super-8) by the video camera, we can clearly see that after two decades of such evolution the term 'television' is no longer suited to this new pattern: it is no longer only the real-time broadcasting of sound and image which characterizes the equipment and its use, but capacities for manipulation of technologies that are converging towards a 'personal screen', some or all of which the viewers can learn

to master, thus ceasing to be passive spectators – if, indeed, they ever were – and becoming the co-producers of their own media.

This reinterpretation of the tendency is of course confirmed and enhanced when we turn to what will remain the great revolution of these decades, and perhaps of the century, in communication: the computerization of society. Once again the revolution consisted not so much in the principles of the technology, which had been developed from the 1940s to the 1960s, as in its extension to general use, beyond the restricted sphere of military and industrial applications. The cultural revolution was not the computer but the fact that from now on it could be personal.[40]

## Economic crisis

The previous period had given Western societies the confident assurance of a continuously rising curve of prosperity, accompanied by a gradual convergence of models for society. The economic crisis which emerged in the mid-1970s has forced the West into a new era, unprecedented in that it has combined recurrent resurgences of relative growth in particular regions or industries with a degree of social exclusion that has been kept high, and an income distribution that has seen increased inequalities replace the earlier diminishing ones. This last feature was largely due to the rolling back of 'welfare', which so far as culture is concerned took the form of cuts in public spending on cultural purposes (most obvious in the United Kingdom under the Thatcher government and, twenty years later, in Italy under that of Berlusconi). Such cuts were extended to eastern Europe with the collapse of the Soviet-dominated regimes and a sharp lowering of ambitions on the part of state institutions.

As the economic crisis affected a culture and society dominated politically by government intervention (national or local) and in intellectual and aesthetic terms by progressivism, we find initially a resurgence of value systems directly opposite to these. Nationalism and racism accordingly regain a higher profile and a community legitimacy which they had lost since the war, even though the intellectual restructuring of the 'New Right' did not actually make them as dominant now as they had previously been invisible. Liberal culture though, already predominant in Scandinavian and English-speaking countries, now definitely gained the upper hand over Marxist culture among the intellectuals of southern Europe, including those who defined their position in terms of the fight against right-wing dictatorships.

Under the impetus of general shifts in technology and markets, cultural life in Europe appears from this point on to have been subjected to the laws of the market alone, laws which already governed some parts of it, such as painting and sculpture, and had done so for almost a century. A number of countries, including France, however, continued to champion the concept of a more organized cultural life based on the protection of copyright and the legitimacy of public regulation and financing. As we can see from the adoption outside France of central bodies such as Ministries of Culture (the formula has been copied not only in the countries of the south, but also in Germany) or regulatory legislation such as retail price maintenance on books, it is not certain that the trend will continue until all modes of

public regulation have been dislodged, and we may note that the European Union itself, though much concerned to encourage subsidiarity and deregulation, in the end decided, when finalizing the Treaty of Maastricht, to include the cultural sphere in its institutions' new field of competence.

## Leisure planet

Contrary to the expectations that would have resulted from a deterministic extrapolation from earlier periods, European cultural behaviour has continued to develop exponentially, in both geographical and demographical extent, notwithstanding the recession.

## Leisure

The post-war years saw a transition from elitist leisure practices (and accordingly from an elitist conception of leisure as something for the ruling classes) to mass popular leisure practices and corresponding ideas. The new element introduced towards the century's end was not, therefore, the phenomena of mass tourism or sport themselves, but the fact that this trend continued despite the lengthening and deepening of the economic crisis. Though it is true that a significant minority of Europeans continue to live with little or no access to leisure facilities and leisure products, sociological investigations have confirmed that the obstacle is now less economic than cultural. Attendance at cultural venues and consumption of cultural objects have grown steadily throughout the period, with appreciable differences between northern Europe and a lagging south; and it is evident that, when incomes fall, leisure spending (whether of money or of time) is cut back, but not systematically cut out.[41]

The actual content of Europeans' leisure activities have undergone a significant transformation, especially in the practice of the arts, where amateur activity is increasing, and in sports, where sports-ground activities such as athletics have been giving way to physical enjoyment of the natural world in the form of mountain sports, water sports or countryside sports such as rambling, cycling, riding, and so on. This period's leisure activities are marked by at least two traits that echo its intellectual trends: a growing concern for individual autonomy and an equally growing preoccupation with the protection of humanity's physical environment. All this, however, has come to be regarded from a point of view that is more and more explicitly a global one, which of course it has to be.

## Globalization

Acculturation, whether limited to local, bilateral and short-lived exchanges or in the extreme form of a virtual murder of a culture by another, dominant one, has been a constant phenomenon throughout the history of humanity. The novel feature now is the acceleration of traffic in forms and values and, above all, the world-wide character of that traffic nowadays, and its apparently unlimited scale. This universality was the logical result of the general spread of communication and duplication techniques coinciding with

the end of the Cold War and the fall of the last ideological barriers, already sapped from every direction, in the early 1990s. The building of new barriers by various religious fundamentalists, Islamic ones in the lead, has been the most extreme but not the only phenomenon which can be seen as proof of the depth of this penetration, which holistic cultures experience as intolerable.

The globalized culture of the early twenty-first century is by and large a culture of the young.[42] It makes much of musical expression (as it emerged from 1960s rock, but now bursting into a great number of styles all seeking to explore its diversity), and of audio-visual productions. These are in addition to a film industry whose finances depend more and more on adolescent audiences, television serials and soap operas (which became a massive industry during the 1970s) and video games, the main play activity of the 1990s. As the generations succeed each other, such forms naturally grow in respectability.

Interpreting the phenomenon of globalization, though, is still a complex matter. While it has strengthened the dominance of the English language, this is still far from absolute: in response, it has provoked a modernization and diffusion, again on an unprecedented scale, of forms of music that stress identity, from folk to world music. The idea that cultures and ways of life were becoming 'Americanized' has been confirmed in the art market or the film industry, but predates this age, going back to the post-war years in the first case and further, in a great many countries, in the second. On the other hand, *fin de siècle* Western Europe has opened itself to other influences: Japanese, for instance, in the marketplace (cartoons, video games), or the East more generally in aesthetic and, above all, philosophical models. And this Europe which is now, since the fall of the Berlin Wall, on course to expand to the whole of the continent, still has the resources to develop its own particular way of doing things, based on the cherishing and use of a heritage which is in total richer and/or better protected than those of other cultural regions, and on a tradition of public engagement ideally suited to limiting the dangers of 'dumbing down' or standardization. Such effects are often decried as the negative side of globalization; but that phenomenon has also, of course, considerably widened the range of available models and the capacity for spreading culture.

### The great return

'Revisionist' is a term applied to particular issues in the field of political ideology (Marxism, the history of the Holocaust); but it is also a reasonably accurate description of the dominant tendency of this period, characterized in art and in intellectual debate by a return to earlier notions, though as often in the sense of 'revisit' as that of 're-adopt'.

## AVANT-GARDES – IN REVERSE

Such revisionism aimed at a critique of the dominant values of the previous period, questioning Marxism-Leninism or even the essence of Marxism itself (the so-called New Philosophers group in France of the late 1970s); it went deeper still, however, and affected the very direction of artistic research in suggesting, from around that time onwards, that the time had come for a 'post-modern'

project.[43] The formula had become familiar in architecture, where it referred to choices of an anti-functionalist kind, more apparent than structural (Ricardo Boffill); it was subsequently applied to an entire posture which deployed old, traditional forms as the final provocation, possible now that every radical experiment had been tried. However, it could be extended to cover all aspects of a hedonistic, fanciful conception of the relations between an atomized yet globalized society and a creativity that had rejected any hierarchy among the arts, any *a priori* distinction between 'good taste' and whatever the opposite of good taste might be. In the field of contemporary music the modernism of the post-war years has stood its ground better, no doubt because at the same time there is provision, in recordings and concerts, for satisfying the taste of a larger audience through widespread and wide-ranging access to the musical heritage (the success of the Early Music movement, for instance); but the return to traditional forms has finally taken off here as elsewhere via developments of minimalism (Arvo Pärt) or lyricism (Thomas Adès).

Without going to such extremes, the whole of contemporary creative endeavour has been marked for some thirty years by a more and more fashionable return to forms which the post-war generations had solemnly repudiated. In literature the tendency is clear: the story, often in a narcissistic form, has regained its position almost entirely, free from the modernist challenges to subject and plot; it is no less clear in painting and sculpture, where figurative work is to be seen again, though abstract art has not utterly given way: here as elsewhere what we have is not a replacement of one single dominance by another but the replacement of all such universal dominance by a multidimensional explosion which some see as freedom, and others as merely a confused noise.

This revisiting, to savage or celebrate as the case may be, of the avant-garde dogmas of the past is not unconnected with the rise of individualism; it relates to the growing scepticism concerning both the established religions and the great political ideologies which came to take their place and have flourished for two centuries. It casts much light on the corresponding widespread popularity of the Heritage movement, which now prompts the ordinary people of Europe to visit, and on occasion to flock to, their 'sites of memory'.

### Heritage

The movement of 'looking back', often tinged with nostalgia or even a readiness to disparage modern times, has been part of our cultural conversation since the very origins of modernity: significantly enough it was known as the Renaissance. The end of the twentieth century went far towards closing the cycle, by gathering within the scope of retrospection the latest periods and most recent aesthetic movements; these had so far escaped this collective memorializing, with its fund of critical explanation and its results in practical initiatives for museums and monuments: as well as baroque music, there is the vernacular architecture of the nineteenth century, the academic painting and sculpture of the same period, the art deco style, the 1960s, and industrial architecture from any age.

Quite apart from this (in one sense definitive) heaping-up of assets, which makes the Western cultural memory, and

particularly the European one, a treasure-chest with virtually nothing left out (something no age has ever known before), the Heritage phenomenon can also be more crudely measured in figures: decisions to protect monuments or sites, new museum openings, and visitor numbers at such places, now being made more accessible in a number of ways to a public no longer restricted to the inheritors of 'proper' culture. If we also consider the energy with which European societies are re-examining, with a more or less critical intent, their own great identity-defining narratives, then we must conclude that one of the enduring and distinctive characteristics of the period is precisely this: the devotion of a considerable portion of today's energies to that which is not of today's world.

## NOTES

1. This idea we owe to C. Lefort, *Essais sur le politique: XIXᵉ–XXᵉ siècles*, Paris, 1986, p. 9.
2. G. Felman, 'Industria e scienza in Germania, 1918–1939', in G. Battimelli et al. (eds), *La ristrutturazione delle scienze tra le due guerre mondiali*, Rome, 1986, pp. 117–31.
3. For a particularly striking history, see S. Lindqvist, *A History of Bombing*, London, 2001.
4. R. Castel, *Les métamorphoses de la question sociale: Une chronique du salariat*, Paris, 1995.
5. For industrial examples see: Y. Cohen, *Organizer à l'aube du taylorisme, la pratique d'Ernest Mattern chez Peugeot, 1906–1919*, Besançon, 2001; and P. Ndiaye, *Du nylon et des bombes: du pont de Nemours, le marché et l'Etat américain: 1900–1970*, Paris, 2001. For agriculture: see N. Jas, *Au carrefour de la chimie et de l'agriculture: sciences agronomiques en France et en Allemagne, 1840–1914*, Paris, 2000.
6. This chapter uses a set of wide-ranging and well-known sources: its own contribution is essentially the provision of a perspective. The notes are accordingly minimal, especially so far as science is concerned. We shall only point out one or two works.
7. L. S. Reich, *The Making of American Industrial Research: Science and Business at GE and Bell, 1876–1926*, Cambridge, MA, 1985.
8. See C. Bigg, *Behind the Lines: Spectroscopic Enterprises in Early Twentieth-Century Europe*, Ph.D. thesis, September, Cambridge, UK, 2001.
9. D. Edgerton, 'Science in the United Kingdom: A Study in the Nationalization of Science', in J. Krige and D. Pestre (ed.), *Science in the Twentieth Century*, Amsterdam, 1997, pp. 759–76.
10. On the omnipresence of the linear model, see S. G. Kohlstedt and M. W. Rossiter (eds), 'Historical Writing on American Science', in *Osiris, Second Series*, Vol. 1, 1985.
11. J. P. Gaudillière, *Inventer la biomédecine: La France, l'Amérique et la production des savoirs du vivant, 1945–1965*, Paris, 2002.
12. For this paragraph and following ones, the details are given in A. Dahan and D. Pestre (eds), *Les sciences dans et pour la guerre*, Paris, 2004.
13. R. S. McNamara, *In Retrospect: The Tragedy and Lessons of Viet Nam*, New York, 1995; and D. Shapley, *Promise and Power: The Life and Times of Robert McNamara*, Boston, MA, 1993.

14. B. Balogh, 'Reorganizing the Organizational Synthesis: Federal-Professional Relations in Modern America', in *Studies in American Political Development*, Vol. 5, 1991, pp. 119–72.
15. For a general historical introduction to the evolution of intellectual property issues down to modern times, see: J. Kevles, *A History of Patenting Life in the United States with Comparative Attention to Europe and Canada: A Report to the European Group on Ethics in Science and New Technologies*, Luxembourg, 2002; and G. E. Bugos and D. J. Kevles, 'Plants as Intellectual Property: American Practice, Law, and Policy in World Context', in *Osiris*, Vol. 7, 1992, pp. 75–104.
16. J. Boyle, 'Fencing off Ideas', in *Daedalus*, Spring, 2002, pp. 13–25.
17. See, among others, P. David et al., 'The Research Network and the New Economics of Science: From Metaphors to Organizational Behaviours', in A. Gambardella and F. Malerba (eds), *The Organization of Economic Innovation in Europe*, 1998.
18. R. S. Eisenberg and R. R. Nelson, 'Public vs. Proprietary Science: A Fruitful Tension?', in *Daedalus*, Spring, 2002, pp. 89–101.
19. R. Buderi, *Engines of Tomorrow*, New York, 2000. This type of development can be traced in reviews such as *Technology Review*, MIT's *Magazine of Innovation*.
20. P. Dasgupta and P. David, 'Toward a New Economics of Science', in *Research Policy*, Vo. 23, No. 5, 1994, pp. 487–521, with an extensive bibliography.
21. K. Pavitt, 'Academic Research, Technical Change and Government Policy', in J. Krige and D. Pestre (eds), *Science in the Twentieth Century*, Amsterdam, 1997.
22. U. Beck (*Risk Society: Towards a New Modernity*, London, 1992) is of course the main reference first on this question.
23. See G. L. Mosse, *Fallen Soldiers: Reshaping the Memory of the World Wars*, Oxford/New York, 1990; and, for example, the works of S. Audoin-Rouzeau and A. Becker, who drew some of their inspiration from Mosse.
24. See J. Fourastie, *Les Trente glorieuses ou la révolution invisible de 1946 à 1975*, 1979.
25. W. Benjamin, 'The Work of Art in the Age of Its Technological Reproducibility', in W. Benjamin, *Selected Writings*, Vol. 4: *Theory of Remembrance*, Cambridge, MA, 2003.
26. E.-M. Unger, *Illustrierte als Mittel zur Kriegsvorbereitung in Deutschland, 1933 bis 1939*, Cologne, Germany, 1984.
27. On this type of medium and the propaganda of the Italian Fascist regime more generally: E. Gentile, *Il culto del littorio: la saccralizzazione della politica nell' Italia fascista*, Rome, 1993.
28. On the history of British broadcasting: P. Scannell and D. Cardiff, *A Social History of British Broadcasting*: Vol. 1: *Serving the Nation*, Oxford, 1991; on French: J.-N. Jeanneney, *L'écho du siècle: dictionnaire historique de la radio et de la télévision en France*, Paris, 1999; on German, in relation to politics: G. Lerg and J.C. Steininger, (eds), *A History of Young People in the West*, Vol. 2: *Stormy Evolution to Modern Times*, Cambridge, MA, 1975.
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32.   There have been few cultural (as opposed to purely aesthetic) studies of twentieth-century music; we may mention H. Dufourt and J.-M Fauquet, *La musique depuis 1945: matériau, esthétique et perception*, Liège, Belgium, 1996.

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# 31

## EASTERN AND CENTRAL EUROPE

*Sergeï L. Tikhvinsky*, coordinator

## INTRODUCTION

*Sergeï L. Tikhvinsky*

In February 1917, a year before the end of the First World War, Russia was rocked by revolution: the imperial government broke down. Nicolas II, the last Tsar of the Romanov dynasty, abdicated. The Provisional Government, which represented the interests of the haute bourgeoisie connected with foreign capital and landholding classes, did not manage to lead the country out of the lingering crises. On 25 October of the same year (7 November of the new calendar) the Provisional Government was overthrown in the course of the socialist revolution and power was passed to the All-Russian Congress of Workers' and Soldiers' Deputies, which unanimously adopted two historical decrees: the peace decree ending Russia's participation in the war and the land decree confiscating landlords' estates. These decrees reflected the desire of a vast part of the population. Vladimir Ilyich Lenin – the leader of the Russian Social-Democratic Party (Bolsheviks) – became head of the Soviet government. From 1918 to 1922 Russia was the arena of a bloody civil war accompanied by the armed intervention of 14 foreign countries.

After the end of the war a number of sovereign states emerged in the former Austro-Hungarian and Russian empires: Austria, Hungary, Yugoslavia, Czechoslovakia, Romania, Poland, Finland, Lithuania, Latvia, Estonia. All of them became republics, with varying degrees of democratic liberties. Soviet republics headed by local communists existed for a short period of time in Hungary and Bavaria in 1919. However, in the 1930s under the influence of fascist Italy and Germany and as a result of internal political processes in a number of states of Eastern and Central Europe, dictatorships were established.

As a result of Russia's three-year-long participation in the First World War and especially due to the civil war and foreign intervention, the country lay in ruins: production fell to 14 per cent of pre-First World War levels; casualties of the wars, hunger and epidemics affected 20 million people. In 1922 there were about 7 million homeless children. In the Volga region about 8 million people perished of hunger due to the drought of 1921–1922. Economic problems were finally solved by a New Economic Policy (NEP) proposed by Lenin. This policy envisaged restricted reintroduction of market relations.

In December of 1922, a new Russia had formed the Union of Soviet Socialist Republics (USSR) together with the Ukraine, Belarus and the Trans-Caucasian Federation of Socialist Republics (Georgia, Armenia, Azerbaijan), as well as autonomous republics and districts of Central Asia (Kirghizia, Uzbekistan, Turkmenia, Tajikistan) and Kazakhstan, which in due course also received the status of socialist republics within the USSR. Three Baltic republics (Estonia, Latvia and Lithuania) and Moldavia joined the Soviet Union in 1940. Thus by the time of Nazi Germany's attack in 1941, the Soviet Union was made up of 15 socialist republics.

Though in theory the supreme authority of the country was vested in the Soviets (councils of workers' and peasants' deputies, later on councils of working peoples' deputies), *de facto* it was concentrated in the hands of the Central Committee of the ruling Communist Party – the only political party that was permitted to exist. The leading role of the Communist Party was fixed in the Constitution of the USSR. After Lenin's death in 1924, and following a severe inner-Party struggle, Josef Stalin became the undisputed and unrestricted leader of the Party. He retained his post of General Secretary of the Party until his death in 1953. By the early 1930s Stalin had established his dictatorial rule both in the Party and the state. The process of industrialization of the country and the creation of collective farms (*kolkhoz*) and state farms (*sovkhoz*) was accelerated. The country's economic development was based on the system of state planning (five-year plans) originated by the plan of Russia's electrification (GOELRO) put forward by Lenin in 1919. Industrialization was achieved only by relying on inner resources, mainly at the expense of the peasants. No foreign loans or investments were available. This policy was supported by a majority of the population, as it was

seen as the only means of overcoming the country's backwardness given the unfriendly relations with countries surrounding the USSR. By the end of the 1930s, substantial social achievements had been realized – illiteracy and unemployment were overcome.

By the mid-1920s the Soviet Union was finally recognized by the majority of foreign states (with the exception of the United States of America, which withheld its recognition until 1933). However, the country received no financial or economic assistance from the rest of the world. Moreover the leading Western states often placed an embargo on Soviet exports, and some neighbouring countries like Japan, Poland, Romania, Turkey as well as the warlords of north-east China organized occasional armed provocations on USSR borders. The Anti-Comintern pact signed by Germany and Japan in 1936 was openly directed against the Soviet Union. The Soviet leadership had to accelerate modernization of the armed forces. During the 1930s, thanks to the rapid development of science, education and culture the government succeeded in creating new branches of industry for the production of aircraft, automobiles and tractors, and radio engineering. However, the country's social institutions and creative work were kept under strong ideological control by the Communist Party; and the waves of repression that had already started during the Civil War and were aimed against those who challenged the Party orthodoxy acquired a mass character in 1937. Many millions were sent to labour camps, where they built roads, canals, industrial objects – or perished; many hundreds of thousands were jailed and executed.

As early as 1933, the Soviet government openly warned the world of the threat of coming war and blamed Nazi Germany and militarist Japan as potential aggressors. Collective security plans were drawn up to confront and avoid the menace.

But the policy of 'appeasement' of aggressors carried out by the Western states (Munich Agreement of 1938, British-Japanese agreements of 1938–1939) forced the Soviet government in August of 1939, on the initiative of Germany, to sign a non-aggression pact with her. By this act Stalin expected to win time to prepare the Soviet Union for rebuffing the approaching military menace from Germany. The unprovoked attack by Germany against the Soviet Union on 22 June 1941 led to the eventual formation of an anti-fascist coalition composed of the USSR, the USA and Great Britain. During all four years of the war the Soviet-German front was the main theatre of military operations; by the end of the Second World War some 507 German divisions were defeated by Soviet troops. The Soviet army expelled invaders of its territory, liberated Poland, Austria, Czechoslovakia, Romania, Bulgaria and Hungary, neutralized Finland and victoriously captured Berlin. To fulfil her obligations as an ally of the USA and Great Britain, the Soviet Union also entered the war against Japan and liberated the north-east provinces of China (Manchuria), North Korea, South Sakhalin and Kurile Islands.

The Soviet victory over Germany, which had at its disposal military and strategic resources from many European countries, was the result of the recent social and industrial mobilization of the entire country, of the vastly improved cultural and educational level of its population, and of the successful development of fundamental and applied science.

The war inflicted huge losses on the Soviet Union: 26.6 million people perished; 1,710 towns and settlements were destroyed, in addition to more than 32,000 industrial enterprises, more than 70,000 villages, and about 100,000 *kolkhozes* and *sovkhozes*. The Soviet Union had to carry out the post-war restoration by relying entirely upon her own resources; neither foreign investments nor loans were available from the West. The problems of post-war development of the Soviet economy were aggravated by the worsening of the international situation and the beginning of the Cold War when the North Atlantic Treaty Organization (NATO) was formed in 1949. The Soviet Union was encircled by a network of American military bases, and the Pentagon worked out numerous plans for possible atomic bombardments of Soviet cities. All this forced the USSR government to redirect huge resources for urgent creation of a rocket-launched nuclear defence screen. Nonetheless by the end of the 1950s the country had restored her economy, became a member of the 'atomic club' and made a breakthrough to outer space. In the 1960s the Soviet Union achieved military and strategic parity with the US. All this became possible due to the strict limitation of social expenditures to address problems of a low standard of living: lack of housing, low wages, insufficient medical care, scarcity of consumer goods. Only those investments into science and education connected with defence remained intact.

After the Soviet Army helped liberate the countries of Eastern and Central Europe from German occupation, a number of 'people's democracies' (later proclaimed as 'socialist regimes') were formed. By the end of the Second World War, communists in those countries enjoyed wide popularity due to their self-sacrificing struggle against the German and Italian occupiers. The new authorities proclaimed their goal of building a socialist type of society and copied the Soviet model to varying degrees: both its positive features (social protection for all people, development of education, science, culture, public health, absence of unemployment) and its negative characteristics (command and administrative control over the economy, Communist Party and state interference in all spheres of social life, strict ideological control, and persecution of heterodoxy).

In 1949 the Council of Mutual Economic Assistance (CMEA) was created. Its purpose was to enhance cooperation between socialist countries, integrate their economic systems, and accelerate their scientific and technical progress. Albania, Bulgaria, Hungary, Poland, Romania, the USSR, Czechoslovakia and, later, the German Democratic Republic (GDR), Mongolia, Cuba and Viet Nam joined CMEA. In 1955, in reply to NATO activity, Albania, Bulgaria, Czechoslovakia, Hungary, the GDR, Poland, Romania, and the USSR concluded the Treaty of Friendship, Cooperation and Military Assistance (Warsaw Pact).

In the mid-1950s, after Stalin's death, there began a short period of liberalization of the strict ideological control by Communist parties in the Soviet Union. The icy relations with countries of Western Europe improved somewhat and were said to 'thaw' during this period.

During the administrations of Nikita Khruschev (1953–64) and Leonid Brezhnev (1964–82), military branches of the Soviet economy continued to develop at the expense of civil ones. As a result, during the years of the ninth Five-Year

Plan (1971–75), economic growth stopped and the country relied only on the income derived from its export of oil. The CPSU failed to continue the planned economy, whose self-proclaimed goal was to provide for social justice. The party leadership did not dare to stimulate market relations or competition. Urgent economic and democratic changes could not be realized under prevailing conditions and authoritarian rule of the aging leadership of the Communist Party. The leaders of CPSU lost touch with ordinary Party members and common people and tried by every means to preserve the status quo, avoiding any reforms that might unblock the economic and social stagnation. All forms of protest against the undemocratic system were ruthlessly crushed by the state, many prominent intellectuals were jailed, forcefully sent to mental hospitals or expatriated abroad like Solzhenitsyn, Brodsky, Medvedev, and Schiransky. President Gorbachev's attempts in 1989–91 to introduce some political and market reforms were condemned to failure because he left intact the old political system with its one-party rule and the command-administrative system of managing the economy. In 1991 leaders of a number of republics of the USSR (and first of all the Russian Federation under the leadership of Boris Yeltsin) proclaimed self-determination and state sovereignty of their republics, ignoring the results of the public referendum that took place in the Soviet Union in March 1991 that showed that 76 per cent of the country's population favoured preserving the Soviet Union. In December 1991, the presidents of the Russian Federation, Belarus and the Ukraine declared the dissolution of the Soviet Union and the creation of the Community of Independent States (CIS). Later on Kazakhstan, the republics of Central Asia, the Caucasian republics and Moldavia joined the CIS, but not the Baltic republics. A new Constitution for the Russian Federation passed in 1993, putting an end to the monopoly of the Communist Party in governing the state; the Soviet period of Russian history was over. Independent states formed after disintegration of the Soviet Union became members of the United Nations, and Russia inherited from the former Soviet Union its seat as a permanent member of the UN Security Council.

The protracted crisis of the Soviet system was already visible by the late 1950s and early 1960s in the socialist countries of Central and Eastern Europe. In Hungary as far back as 1956 there was an attempt to free the country from Moscow's tough grip, democratizing society and implementing market reforms. A similar attempt was made in Czechoslovakia in 1968, but both efforts were quashed by force by the Soviet Union and some of its Warsaw Pact

*Map 10* **The break-up of the Soviet Union**

partners. Eventually, disintegration of the Soviet Union provoked a rapid break-up of all the communist-led regimes in Eastern Europe.

The breaking-up of the integral economic, cultural and scientific common space established in the course of centuries between different areas of the former Soviet Union had a perilous effect upon the economy, science, education, culture and public health of the newly independent states; it is still hindering the all-scale application of their market and political reforms.

Drastic budget cuts for fundamental and applied sciences in Russia resulted in the mass emigration of highly trained specialists and engineers to the USA and Europe as part of a continuing brain drain.

# 31.1

# THE SOVIET UNION AND THE RUSSIAN FEDERATION

## *Sergeï L. Tikhvinsky* and *Yuri S. Borissov*

As a united multinational state, the Union of Soviet Socialist Republics (USSR) existed from December 1922 until December 1991. In this chapter we discuss education, science, social science and humanities, literature and art, as these relate to all 15 republics that formed the Soviet Union before its dissolution (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kirghizia, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan).

### EDUCATION

The immediate task facing the young Soviet government after its formation on 25 October 1917 – according to the old calendar, or 7 November according to the new one – was the liquidation of the dark and painful heritage of the past: two-thirds of the population was illiterate, two-thirds of adults could neither read nor write. The day after the revolution, Vladimir Lenin, the head of the government, informed Anatoly Lunacharsky, a prominent writer, dramatist and philosopher, that the Central Committee of the Communist Party had appointed him as People's Commissar for Education. 'It is for you to overcome illiteracy in Russia' is what Lenin told him. Two days later the People's Commissariat for Education published an appeal that read: 'Any real democratic power in this country where illiteracy and ignorance prevail must first set itself the task of fighting against this state of unenlightenment. It must try to achieve universal literacy in the shortest period by organizing a network of schools using modern methods of pedagogy and by introducing universal, obligatory and free education ... the struggle against illiteracy and ignorance cannot be restricted only to in-school education for children and youth ... Adults will also be eager to escape from the humiliating state of a person who cannot read and write. Schools for adults must take up a large place in the general scheme of people's education.' Lenin's wife, Nadezhda Krupskaya, a teacher by training, became chief of the adult education section of the People's Commissariat for Education, later becoming deputy People's Commissar. Until the end of her life she worked in the field of *people's education*.

In October 1918, by decree of the government, a whole new spelling system was introduced, which helped in the struggle to combat illiteracy.

The Programme of the Russian Communist Party adopted in 1919 established certain basic school principles: teaching using the native language, co-education of boys and girls, full separation of schools from the Church, and making a seamless connection between teaching and productive public labour. The spread of literacy, the liquidation of cultural backwardness in the outlying areas of the country and the introduction of obligatory general primary and secondary education were considered the indispensable starting points for the country's cultural growth and development of the national economy.

By the end of the Civil War and foreign intervention about seven million children had neither home nor parents. Yet the government was able to overcome the crisis by providing them shelter, clothes, food and schooling in various orphanages.

The struggle against illiteracy was also conducted in the Red Army, which was formed for the most part by illiterate peasants. In order to spread literacy, special theatrical propagandist teams were created, and wall newspapers and posters were issued. During those years a series of amusing posters called 'Windows of Satire of the Russian Telegraph Agency' (ROSTAS) was very popular due to their sharp and witty cartoons and poetic texts. They lashed out against the lack of culture, drunkenness, bureaucracy, bribery and other anti-social phenomena and in an easy form acquainted people with elementary rules of sanitation and hygiene as well as touching upon timely subjects of domestic and foreign policy. The poet Vladimir Mayakovsky, and artists like Mikhael Cheremnykh and Dimitry Moor also participated actively in 'Window's' issues.

Opportunities for raising the standards of literacy and culture were also provided to non-Russian people. Beside Russians, who represented half of the whole population, there were more than 100 large and small non-Russian nations. In all national republics and regions native languages were introduced alongside the official Russian language. For those ethnic groups that did not have national alphabets before the Revolution, written languages were created. Newspapers, magazines and books written in national

languages were published in huge numbers. As a result, by 1932 the total number of literate adults had increased to 90 per cent, and by the beginning of 1939 literacy had reached 95.1 per cent of the total population. Obligatory universal primary education was introduced in 1931. By a decision of the Central Committee of the Communist Party in September 1931 all forms of post-revolutionary ultra-leftist experiments in the field of education were abolished. In the school year 1914/1915 there were 9.6 million pupils enrolled in school; by 1927/1928 there were 11.5 million and in 1940/1941 35.5 million children were attending school. In the year 1956/1957 some 30 million pupils were being trained in general-education schools of the Soviet Union. Alongside the general-education schools, secondary professional schools and technical colleges were also functioning.

Regarding higher education, the programme adopted in 1919 gave wide admittance to high school for all who wanted to study, and especially for workers; it was decided to open recruitment of lecturers in high school to all available personnel; to remove every kind of artificial barrier between new research cadres and old university chairs; and to offer material support to students so that workers and peasants would also have the opportunity to enjoy a high school education. In order to assist common people to prepare for their entry into higher educational institutions a network of so-called 'workers' faculties' (*rabfaks*) was created. In 1955–1956 more than 2 million students were studying in 765 institutions of higher education of the Soviet Union. Widespread and free secondary and higher education was one of the important social achievements of the country. After the Second World War, the doors of all institutes of higher education and universities were opened wider still to include many foreign students, especially from socialist countries and the developing countries of Asia, Africa and Latin America.

During the 1920s and early 1930s pedagogical training was strongly influenced by different ultra-left theories whose followers denied the leading role of the teacher at school, and recommended instead that the teacher could be replaced by 'self-study brigades'. They disseminated popular sociological schemes of 'proletarization' of teaching methods and introduced a decorative badge, 'Arts for Proletarian Children'. Among the major figures in the struggle against such 'leftist' theories were Vasily Aleksandrovich Sukhomlinsky, whose philosophy of education combined teaching with pupils' practical work, and Anton Makarenko, who started the idea of re-educating juvenile delinquents in special children's colonies that combined work with education.

In 1943, the highest pedagogical establishment of the country, the Academy of Pedagogical Sciences, was founded. By 1987 it consisted of 45 full members-academicians, 84 corresponding members, and 15 research institutes grouped in four departments: Theory and History of Pedagogics, Didactics and Private Methods, Psychology and Age Physiology, and Pedagogics and Psychology of Professional and Technical Training. After the disintegration of the USSR, the Academy of Pedagogical Sciences was re-organized into the Russian Academy of Education.

Libraries made an important contribution to raising the educational level of the population. In 1914 there were only 12,800 libraries in Russia and their total fund equalled 8.9 million books, whereas in 1956, libraries numbered 391,952 with the total reserves of 1,352 million books. The most popular libraries were: Moscow State Library, named after Lenin and housing 19 million books, the Libraries of the USSR Academy of Sciences in Moscow and in St. Petersburg, the Library of Moscow State University, the Moscow Library of Foreign Literature, and the many libraries in each of the capitals of the Soviet republics and in their provincial universities.

## MUSEUMS

Museums also attracted state attention. The most prominent were: in St. Petersburg – the Hermitage, Cabinet of Curiosities of the Academy of Sciences, the Russian Museum, the Petropavlovsk Fortress, Petrodvorets, the Winter Palace; in Moscow – the Historical Museum, the Kremlin Museum, the Tretyakov Gallery and the Museum of Fine Arts; the former tsar's country palaces, Kolomenskoe and Tsaritsyno, palaces and private residences of the aristocracy and merchants; in Kiev – ancient monasteries and churches; Echmiadzin in Armenia; Metekh in Georgia; the emir's palaces in Bukhara and Khiva. State support was a big help for organizing ethnographic and history museums all over the country (in Pskov, Krasnoyarsk, Irkutsk, Ekaterinburg), and in the towns of the so-called Gold Ring (Yaroslavl, Rostov, Serpukhov, Souzdal.) Many nature reserves and architectural heritage sites were also established in Kizhi, Lake Baikal, Prioksko-Terrasny Biosphere Reserve, and the Caucasus and Askania-Nova Reserves in the Crimea. Numerous museums were devoted to presenting the life and work of outstanding scientists and artists: Konstantin Tsiolkovsky in Kaluga; the Museum-Reserves of Aleksandr Pushkin in Mikhaylovskoe; Leo Tolstoy's estate in Yasnaya Polyana; Ivan Turgenev in Spasskoe Lutovinovo; A. Chekhov in Yalta; Taras Shevchenko in Kiev; Yanka Kupala in Minsk; Ivan Aivazovsky, the painter of seascapes, in Feodosia; painter Vasili D. Polenov on the Oka River; composer Piotr Ilyich Tchaikovsky, in Klin.

Mass organizations also contributed to raising the general educational and cultural level through a wide network of various cultural and educational enterprises like sports clubs, public parks, palaces and cultural centres. The latter functioned on the basis of amateur talent activity and local initiative. They included a lot of different musical, dramatic, choreographic, chess, and sports activities as well as permanent lecture series on different scientific, cultural and educational topics. Many well-known musicians, singers, painters, and sportsmen began their careers in these circles that were often led by skilful pedagogues. In 1947, the All-Union Scientific and Educational Society named *Znanie* (Knowledge) was organized with branches in every union and autonomous republic. It made an important contribution in the raising of the educational and cultural level of the population.

## SCIENCE

During the years of the Civil War and foreign intervention (1918–24) when the whole population of the country suffered from hunger, the government at the initiative of

the writer Maxim Gorky, formed a committee for the improvement of scientists' way of life. This committee rendered assistance to scientists and artists in need. During these years the government also provided money for the foundation of such large centres of fundamental and applied sciences as the Optic Institute (directed by Dimitri Rozhdestvensky), Institute of Aerodynamics (Nikolai Zhukovsky), Physics-Technical Institute (Abram Ioffe), Radium Institute (Vladimir Vernadsky), and the Institute of Biological Chemistry (Alexei Bakh), as well as chemical, automotive, electrotechnical institutes and a radio engineering laboratory (in Nizhny Novgorod).

In 1925 the Russian Academy of Sciences, which had been founded in 1724, was transformed into the USSR Academy of Sciences. It became the leading and coordinating centre of science in the country. Some important scientific institutions like the Institute of Physiology (headed by Ivan Pavlov, a 1904 winner of the Nobel Prize), Physics-Mathematics Institute (Vladimir Steklov), the Institute of Soil Sciences named after Vasily Dokuchaev, and other previously independent institutions headed by leading specialists in the field were integrated into the Academy. In 1934 the Presidium of the USSR Academy of Sciences moved to Moscow from Leningrad. In the process of industrialization many new scientific-research centres and institutes were established throughout the 1930s. These included the Physical Institute (Sergei Vavilov), Institute of Organic Chemistry (Aleksandr Favorsky and Nikolai Zelinsky), Institute of Problems of Physics (Pyotr Kapitsa), and the Institute of Theoretical Geophysics (Otto Shmidt). The Academy began to organize its branches and departments in various capitals of the union republics – in Siberia, in the Urals, and in the Far East of the Soviet Union. The Academy of Sciences of the Ukrainian SSR had been founded in Kiev as early as 1919, followed by the Academy of Sciences of the Belarussian SSR in Minsk, in 1929. In the period between 1941 and 1961 Academies of Science were organized in all the other republics with the assistance of the USSR Academy of Sciences.

During the war years (1941–45) the entire energy of Soviet science was concentrated on achieving victory. In the course of military actions more than 600 scientific institutions were damaged or destroyed by the German Army, among them the famous Pulkovo and Simeiz observatories (now renamed the Crimean Astrophysical Observatory). Timely evacuation of scientists and scientific institutions from the western parts of the USSR allowed the country to build up new scientific centres in the rear – in the Volga region, in the Urals and Siberia. They fulfilled important tasks given to them by the State Committee for Defence such as ensuring ships' security from magnetic mines, and finding solutions to many military and technical problems. In the country's outlying areas, geologists carried on the search for strategic minerals. These minerals and raw materials were necessary to keep many industries functioning even though the territories were occupied by the enemy. At the urgent request of the Supreme Command of the Soviet Army, the Presidium of the USSR Academy of Sciences formed several special commissions headed by the leading scientists to solve these military and technical problems. The list included: Abram Ioffe, Igor Kurchatov, Aleksandr Aleksandrov, Leon Orbeli, Vladimir Komarov and Alexander Fersman. Close cooperation was established between specialists in the fields of fundamental sciences and scientists, engineers and technologists working in different branches of applied sciences. This cooperation helped to strengthen the military might of the country. During the war years the T-34 tank was created; later it was recognized as the best tank of the Second World War. For the first time in tank-building history, the turret of this tank was produced by electric welding, a process developed by Boris E. Paton, Director of the Institute of Electric Welding of the Ukrainian Academy of Sciences. The best attack plane of the Second World War, the Il-2, (built by Sergei Ilyushin), the TU-2 dive-bomber (built by A. Tupolev) and Pe-2 (built by Vladimir Petlyakov) also appeared during those years. Finally, the multi-rail rocket launcher with the tender name of 'Katyusha' was put into production, along with a very efficient automatic rifle invented by Mikhael Kalashnikov.

In the post-war period one of the most important events in the development of science was the government's decision to build an 'academic town' in Novosibirsk. Even now, 40 years since its founding, it is still an outstanding model of a scientific centre (its initiator and organizer was a leading specialist in mathematics and mechanics, Professor Mikhael Lavrentiev). Later, scientific and technological satellite centres of the Academy of Sciences were also established in towns near Moscow: Pushchino, Chernologolovka, Serpukhov, Troitsk, Dubna, and Zelenograd.

In the early 1970s the number of scientific staff employed by the Soviet Academy of Sciences was about 1 million people; and expenditures for science had increased twelve-fold by comparison with 1950. Also since the 1950s, many thousands of young specialists from socialist and developing countries had been postgraduates of institutes of the Academy of Sciences.

After the disintegration of the Soviet Union, the USSR Academy of Sciences was transformed into the Russian Academy of Sciences. In 1998 it had 458 full members and 677 corresponding members. Its 440 research institutions were attached to 18 departments covering: mathematics, physics and astronomy, engineering, computer sciences, chemistry, biology, geology, oceanography, history, philosophy, sociology and law, economics, international relations, literature and languages.

Below we offer a brief summary of research results in different branches of natural science, social science and the humanities.

Mathematical theory was greatly developed, covering the theory of numbers, functions, differential equations and functional analysis, of optimum control, probability, topology, and mathematical logic. In these fields new directions and approaches are closely connected with the names of Ivan Vinogradov, Andrei Kolmogorov, Alexander Lyapunov, Nikolai Bogoliubovv, Lev Pontryagin. Works by Mikhail Lavrentiev on hydrodynamics, the theory of cumulation, and the physics of explosions and impulsive processes were widely known in the field of applied mathematics. Mstislav Keldysh did outstanding work on the theory of non-self-conjugate operators, prevention of wing flutter, and calculation of cosmic orbits. Leonid Kantorovich was awarded a Nobel Prize in 1975 for his work in economics and mathematics. Alexander Sergei Lebedev is recognized for his contribution to computational technologies.

The most important work on aerodynamics was done by Nikolai Zhukovsky and Sergei Chaplygin, which provided

the basis for new developments in aerodynamics of supersonic velocity, non-linear mechanics, the theory of space flights, the mathematics of elasticity, and the theory of non-linear oscillation. In 1913 the first four-engine airplane was constructed by Igor Sikorsky, who during the Civil War emigrated to the USA.

## SPACE RESEARCH

Space research built upon work done by Konstantin Tsiolkovsky (1857–1935), an early twentieth-century pioneer in rocket propulsion who also proved the possibility of human space travel; Vladimir Vernadsky, whose visionary work on the synthesis of living and inorganic natural bodies is the basis of modern ecology and studies on the biosphere; Alexandr Chizhevsky, one of the founders of heliobiology, which looks at solar effects on human beings; and Vladimir Sukachev, who was one of the founders of biogeocenology, a field combining botany, soils and diversity.

In 1933 the first Soviet stratospheric balloon reached an altitude of 19,000 metres. The practical beginning of research in open space became possible due to the creation of rocket propulsion techniques developed by Fridrich Tsander, and due to their further development by Sergei Korolev, Vladimir Chelomei, and Mikhael Yangel. The first artificial Earth satellite (*Sputnik*) was launched on 4 October 1957. On 12 April 1961 the first manned space flight was undertaken by Yuri Gagarin. In June 1963 the first woman-cosmonaut Valentina Tereshkova made her orbital flight. Manned flights were preceded by a series of medical and biological investigations on the effects of weightlessness on dogs and other living beings (by Vasily Parin, Norair Sisakyan, Oleg Gazenko). A number of orbital stations were built for long duration work on the round-the-Earth orbit. The latest station of the kind *Mir* with a mass of about 40 tons was launched on 20 February 1986 and continued functioning until it was 'retired' in 2001. By then, some twenty-seven teams of Russian cosmonauts and researchers from twelve foreign countries had worked by turns at that station.

Rocket technology was closely connected with national defence. Such mobile intercontinental rockets as *Topol* and *Pioneer* were installed on special tracks invented by Belarussian engineer Boris Schaposhnikov.

In space research, as well as in other branches of Soviet science, one has to mention the unique team spirit of scientists, engineers and technicians, which was due to the Soviet educational system. It had deep roots in old Russia's traditional rural life (*obchina*). This spirit of collectivism, sponsored by the Communist Party, was evident during the Second World War, known in the USSR as the Patriotic War against fascist Germany and, afterwards, during the process of healing the wounds of war.

Progress in cosmic rocket technology allowed the installation of stable radio and telecommunication systems, and investigation of the surface and deep strata of the Earth, the atmosphere, near space, as well as planets and comets in the solar system. In 1966 *Luna 9* was the first spacecraft to achieve a lunar soft landing and to transmit photographic data to Earth; in 1970 *Luna 10* returned to the Earth with some samples of moon soil. *Luna 11* was launched towards the Moon from an Earth-orbiting platform and entered lunar orbit on 28 August 1966.

In 1975 Venus and Vega stations began a complex research of the planet Venus. They lowered several landing apparatuses onto the planet's surface and launched balloons into its atmosphere. Vega also explored the Galley comet.

The Pulkovo and Simeiz Observatories, which were destroyed in the war, were fully restored and a large new astrophysical observatory was built near Bakhchisaray in the Crimea. Observatories in the Crimea, Bjurokan, Shemakha, Estonia and Latvia were equipped with new telescopes. In 1975 an observatory was built in the North Caucasus with a reflector mirror of 6 metres in diameter. The radio telescope RATAN-600, with its ring-shaped reflector and 600-metre surface diameter was also built there. Radio location research of the Moon, Venus, Mercury, Mars and Jupiter were carried out under the leadership of Vladimir Kotelnikov Photos of the back side of the Moon were received from artificial Earth satellites.

Victor Ambartsumyan developed a theory of celestial associations of stars, which confirmed the continuity of the process of star genesis. An hypothesis for the origin of stars and planets was put forward by Otto Shmidt and Vasili Fesenkov. In the 1960s Michaël Molodensky worked out the theory of rotation of the Earth with a liquid nucleus, accepted in 1979 as the basis of a new system of coefficients notation. The theory of radio-emission of supernova remnants was elaborated in the 1950s by Vitali Ginzburg and Yakov Zeldovich. Andrei Severny studied weak magnetic fields of stars. The history of radioastronomy is closely connected with the name of astrophysicist Iosef Shklovsky.

## PHYSICS

To begin with, the theoretical physicists Igor Tamm (Nobel Prize of 1958), Lev Landau (Nobel Prize of 1962), Leonid Mandelshtam, Mikhail Leontovich, Nikolai Bogoliubov and Ilya Frank (Nobel Prize of 1958) all made important contributions to the various branches of modern physics: quantum field theory, plasma and solid state physics, superconductivity, superfluidity and nuclear physics.

In the 1930s Abram Ioffe initiated systematic investigation of transistors, and by the 1950s the main principles of power transmission had been worked out. As early as the 1930s scientists were working to synthesize crystals, which resulted in industrial production of artificial quartz, corundum, sapphires and diamonds. In 1951 Alexei Shubnikov proposed a general theory of symmetry and asymmetry of crystals. In 1975 Alexander L. Vereshchagin published his seminal works on the transformation of hydrogen into metal under super-high pressure.

In the 1920s showers of cosmic rays were discovered by Dimitri Skobeltsyn. In 1940 Georgi Flerov and Konstantin Petrzhak together discovered the phenomenon of spontaneous nuclear fission and developed theories to account for it. During the war years the theory of synchrotron radiation was put forward, along with principles explaining how high energy particle accelerators work.

As early as 1939–41 Yuli Khariton and Yakov Zeldovich carried out the calculation of the nuclear division chain. Under the direction of Igor Kourchatov the first Soviet

cyclotron was constructed in 1939, and in 1946 the first nuclear reactor in Europe was built. He also headed the team that created the first Soviet atomic bomb (1949) and later the thermonuclear bomb (1953). Andrei Sakharov (Nobel Peace Prize of 1975) and Y. Khariton were key contributors.

The problem of guided thermonuclear synthesis was being investigated at this time; the so-called 'Tokomak' system of was devised, which soon became the basis of international thermonuclear research. Alternative ways were proposed to realize a guided thermonuclear reaction– by heating of plasma with a powerful laser beam from a bundle of electron rays.

Research of atomic nuclei and elementary particles was greatly extended when, in the 1970s and 1980s, large accelerators were built. Many new elementary particles were revealed, and experiments done on the proton accelerator in Serpukhov (operational in 1967) allowed scientists to observe and describe the interactions of particles under high-energy conditions. After the underground neutrino observatories were brought into operation research on neutrino physics and astrophysics of particles of super-high energies coming from space progressed greatly.

In the field of optics Serfei Vavilov and his colleagues Igor Tamm, Semen Shubin and Yuri Denisyuk conducted fundamental research on luminescence; they discovered the radiation effect of electrons moving with superlight velocity, known as Vavilov-Cherenkov radiation (Nobel Prize of 1958). In 1931, the quantum theory of photoeffect in metals was worked out by Tamm and Shubin. Denisyuk made a very important contribution to optics through his work on holography with 3D media recording optics in the late 1960s.

In the 1950s quantum electronics came into being. Alexandr Prokhorov and Nikolai Basov (Nobel Prize of 1964) developed molecular generators (masers) and later on quantum generators in the optical diapason of wave length (lasers). Achievements in the field of physics of low and super-low temperatures are connected with the name of Pyotr Kapitsa (Nobel Prize of 1978), who discovered the super-fluctuation of liquid helium.

In the field of marine acoustics, one must mention the achievements of Leonid Brekhovskikh in the field of musical acoustics, and of Leonid Termen, who made the first electric musical instrument – a 'termenvocks' – as long ago as the 1920s.

In the field of radio physics, Soviet scientists studied the propagation of radio waves of different frequencies, statistical radio physics, and investigated the natural environment using radiophysical methods. In 1944 Evgeni Zavoysky opened up the phenomenon of electronic paramagnetic resonance, which gave impetus to research on the structure of solids, liquids and molecules.

Vladimir Zvorykin, who emigrated to the United States in 1919, later developed and patented (1929) an electronic scanning device that became the first practical 'pickup' tube for television. He named it the Iconoscope.

## CHEMISTRY

In the 1920s Lev Chugaev and Nikolai Zelinsky made their mark in the chemistry of composite compounds and the transformation of hydrocarbons and petrochemistry,

respectively. Nikolai Kournakov advanced the methods of physico-chemical analysis.

The discovery of appropriateness of heterogeneous and homogeneous catalysis as well as non-stationary catalytic processes elaborated by Georgi Boreskov gave rise to new and more efficient catalysts. Vladimir Ipatiev, working in the United States from 1930 onwards, was one of the founders of catalytic organic synthesis. In the 1930s Sergei Lebedev elaborated an industrial method for producing synthetic rubber; after which the chemistry of polymers developed rapidly.

In the post-war years chemistry of elemento-organic compounds was another field of intense development (school of Alexander Nesmeyanov), regularly creating organic compounds for most elements of Dimitri Mendeleev's periodic table. The famous Kazan School of Chemistry was founded by Boris A. Arbuzov and made significant contributions to the chemistry of phospho-organic compounds – one of the future branches of elemento-organic chemistry.

Nikolai Semenov made an important contribution to chemical kinetics by first working out a chain theory of chemical reactions, combustion and detonations for which he won a Nobel Prize in 1956. New physical methods of stimulation of chemical reactions by radiation and light laser beams, shock waves and plasma were developed.

Ivan Bardin and Alexandr Baykov and their colleagues succeeded in increasing the efficiency of ferrous and non-ferrous metals, by producing heat- and acid-resistant alloys.

## BIOLOGY

Everyone has heard the names of Ivan Pavlov, a physiologist best known for his studies on conditioning the behaviour of dogs, and Nikolai Vavilov (1887–43), a plant geneticist who traced the origin of cultivated plants. Nikolai Koltsov was an exceptional plant breeder and geneticist. Andrei Belozersky proved the unity of the plant and animal kingdoms. Vladimir Engelgard put forward a biochemical explanation of muscular contraction, while Andrei Bakh worked out the theory of the chemical composition of breathing. Fundamental works on agrochemistry and plant nutrition produced by Dimitri Pryanishnikov and his school are still valued, as is the published work of K. Skryabin.

In the 1920s and 1930s works by Nikolai Vavilov, Nikolai Koltsov, Sergei Chetverikov, and Alexandre Serebrovsky all made an important contribution to genetics. But beginning in the mid-1930s and especially after 1948 Soviet biology and genetics suffered from Party ideology and especially the influence of Trophim. Lysenko, a plant breeder who rejected chromosome theory and supported the doctrine that characteristics acquired through environmental influences are inherited (acquired characteristics). Scientists who opposed his views lost their jobs, were sent to Siberia, or were executed. Thus the whole field of genetics was virtually suspended until 1965.

## EARTH SCIENCES

Earth sciences were closely connected with the planning of the national economy. Geologists made a series of maps

using theoretical prognoses and data from reconnaissance expeditions. These maps guided the search for minerals and for a better understanding of the structure and evolution of the Earth, volcanic activity and tectonics. Rich oil- and gas-fields were found in East Siberia, Turkmenistan and the Caspian Sea; diamonds were discovered in the Yakutia and Arkhangelsk region; and gold in Uzbekistan.

Dmitri Shcherbakov and Alekandr Vinogradov worked successfully in the field of geochemistry. They investigated the Earth's crust using extra-high impulse electric current and drilling a number of super-deep holes – one of which reached the record depth of 12 kilometres. Alexander Peive contributed significantly to the geophysical structure and tectonic dynamics of the Earth's crust and mantle. He examined underwater ranges in the Atlantic and Pacific Oceans and in the Antarctic, discovering powerful counterflows in the Atlantic and Indian Oceans. As far back as 1928 arctic pilots and the icebreaker *Krasin* had participated in the rescue of the Italian expedition of Umberto Nobile, which failed to reach the North Pole in a dirigible airship named *Italia*. In 1932, the Sibiryakov expedition set sail under Otto Shmidt and covered 5,600 kilometres of the North Shipping Route during a single voyage. In 1937 the first Arctic expedition headed by Ivan Papanin landed on a drifting ice field near the North Pole. Between then and 1987 there were 30 similar research units named North Pole. In 1937 Soviet pilots Valeri Chkalov and Mikhail Gromov accomplished non-stop flights of record length from Moscow to the USA over the North Pole. Soviet ship-builders constructed the world's first atomic icebreaker, the *Lenin*. At present, nine atomic icebreakers ensure there is permanent navigation along the North Shipping Route and it is now routine to reach the North Pole safely.

Since 1957 Soviet scientists have been participating in international projects to study Antarctica and have taken part in 44 Antarctic expeditions. One permanent research unit has discovered the existence of a lake lying three-kilometers deep under Antarctic ice.

## ELECTRIC POWER ENGINEERING

The State Plan of Electrification of Russia (GOERLO) envisaged construction of hydroelectric power stations (HPS), thermoelectric power stations working on local fuel (peat), development of electro-consuming industries, and improvement of river navigation. Accordingly, the Volkhov (December 1926) and Dnieper (May 1932) HPS were built. By 1935 the GOERLO Plan was over-fulfilled. By 1940 the total output of electric energy exceeded the GOELRO planned by a factor of 6. By 1982 the Soviet Union held first place in the world in terms of primary commercial power resources (including oil and solid fuel, gas and electrical energy). Cascades of HPS were built on the Volga and Angara Rivers and on many others. Soviet engineers constructed the High Dam at Aswan on the Nile in Egypt during the 1960s. In 1954 the world's first nuclear power station (NPS) was constructed in Obninsk, followed by many others. In 1987, however, after the Chernobyl nuclear power disaster, much more attention was paid to human and environmental safety throughout the energy supply sector.

## ECONOMY

In the early 1920s, the government began to draw up development plans for the national economy; economists, energy specialists, geologists and many other scientists were consulted. The first plan was a five-year State Plan of Electrification of Russia. Since 1929 the Soviet Union continued to develop according to five-year plans, except for one seven-year period from 1959 until 1965. The following guiding principles were common to all: the importance of developing heavy industry and building large industrial complexes; use of the most advanced technologies combined with maximum use of local raw materials and resources; and equal attention to the development of industry and agriculture. In the 1920s, the Russian economist Nikolai Kondratiev identified a price cycle that is 50–60 years long. He used it to predict the depression of the 1930s. Although he worked on the Soviets' first Five-Year Plan, he was imprisoned and died in Siberia.

In the 1950s economists of the so-called 'mathematical school' (Leonid Kantorovich, Vasili Nemchinov, Viktor Novozhilov) concentrated their attention on 'optimal planning'. At the beginning of the 1960s Evsei Liberman and Vladimir Nemchinov proposed reforms directed against strict centralized planning. At the beginning of the 1970s scientists from the Central Economico-Mathematical Institute of the USSR Academy of Sciences (headed by Nikolai Fedorenko) proved that keeping the command-administrative system and economy would lead the country to deadlock and proposed a programme of reforms. But those proposals as well as the reforms proposed by Prime Minister Alexei Kosygin (1904–80) were rejected by the conservative leadership of the Party. The results of Soviet economic science remained unclaimed and the country's economy stagnated.

## PHILOSOPHY

Violent class struggle during the Civil War years and period of foreign intervention (1918–22) left their impact on public life. Communist Party leaders officially proclaimed the necessity to fight against any hostile ideologies or bourgeois and petty bourgeois remnants. In 1922 a large group of prominent dissident philosophers, sociologists, historians, and writers were forcibly deported from the country. They belonged to the liberal wing of public opinion, which had been formed before the war. The most outstanding representatives of liberal philosophy and idealist views were: Petr Struve (neo-Kantian metaphysics), Nikolei Berdyaev and Sergei Bulgakov (religious-philosophic school), Pavel Milyukov (adherent of positivism), Pitirim Sorokin (spoke out in favour of the development of religious culture).

In the 1920s national and religious movements such as Pan-Islamism and Pan-Turkism gained followers among the Muslim population of the country. One of the first decrees of the Soviet administration was the separation of church and state. For the sake of propaganda the government started an extensive anti-religious campaign headed by the 'League of Militant Atheists'. As a result, many churches, mosques and synagogues were closed; and numerous priests were arrested as accomplices of rich peasants (so-called *kulaks* who employed agricultural workers), along with other suspected enemies of socialism. In the beginning of

the 1930s numerous philosophers, historians, writers and artists were charged with belonging to this or that bourgeois or religious group and were persecuted. In due course, the leadership of the Communist Party began to limit extreme, ultra-left, anti-intellectual tendencies. Representatives of these leftist ideas insisted on 'proletarization' of philosophy, history, literature and art. In 1938 a *Short Course on the History of the Communist Party*, edited by Stalin, was published and widely distributed. One chapter written by Stalin himself contained the basic points of Marxist-Leninist philosophy and historical materialism and dialectics. The 'Short Course' was obligatory throughout the education system. Its appearance was dictated by Stalin's desire to standardize public thought and his attempts to prevent any appearance of non-conformism after he had succeeded in rooting out any opposition within the Party. Though in the 'Short Course' several schools of Western European and American philosophy were severely criticized, readers of the 'Short Course' could not go to the original books by foreign authors and had to accept the opinion offered on blind trust At the same time works by Karl Marx, Friedrich Engels and Vladimir Lenin were published in mass copies, giving thinking readers an opportunity to get acquainted thoroughly with Marxist-Leninist theory and historical and dialectical materialism. A lot of prominent Soviet intellectuals, artists and scientists of those years – N. Vavilov, S. Vavilov, V. Vernadsky, A. Ioffe, V. Komarov, N. Kournakov, I. Michurin, O. Shmidt and others – mastered the Marxist methodology and fruitfully used it in their everyday research. After the war, the most important contribution in classical philosophy and aesthetics was made by Aleksandr Losev; Yuri Lotman's work on semiotics also won wide recognition.

During the war against Nazi Germany anti-religious propaganda was stopped by the state, and churches and mosques began to open. But after the war Stalin again introduced new ideological pressure against 'cosmopolitanism' and 'cringing' before the West. Biologists were hounded, while genetics and cybernetics were proclaimed 'pseudo-sciences' and brought to a halt.

When Nikita Khruschev 'dethroned' Stalin, this was not accompanied by any new philosophy. Repression of non-conformists continued (e.g. A. Sakharov's exile, dissidents' deportation from the country or their confinement in mental institutions). Moreover, the ideological battle between dogmatists and realists was extended from the home front to international relations. Dogmatists persisted in believing there could be no compromise between socialist and capitalist systems. Representatives of the realistic school, who borrowed Lenin's thesis about the possibility of peaceful co-existence of states with different social-political systems, insisted that at the end of the twentieth century it was necessary to solve urgent global problems such as safeguarding peace, protecting the environment, and reducing poverty, starvation and epidemics; they believed such goals could be reached only by a common effort of all countries of the world. Late in the 1980s and especially after Russia's proclaiming of sovereignty and the dissolution of the Soviet Union in 1991, Orthodox, Muslim and Buddhist faiths initiated activities in the Russian Federation. Some Russian philosophers returned to the 'Eurasian idea' whereby Russia was viewed as a 'bridge' between civilizations of the West and East. It was a country that had absorbed Byzantine

and Western cultures as well as elements of nomadic tribes, such as the Scythes, Khazars and the Golden Horde.

## HISTORY, ARCHAEOLOGY, ORIENTAL STUDIES

During the Soviet period the study of history was heavily politicized. Certain Marxist historians absolutized the class struggle, describing the historical process schematically (school of Mikhail Pokrovsky). Only in 1934 was history re-introduced in Soviet universities. In 1936 the Communist Academy where historical disciplines had been concentrated was dissolved, to be replaced by the Institute of History as part of the USSR Academy of Sciences.

During the war years attention to the history of the motherland increased: books by professional historians glorifying national patriotism (*Napoleon*, *The Crimean War* by Evgeni Tarle) and by writers of fiction with historical plots (*Genghis-Khan*, *Batu* by Vasili Yan Yanchevetsky) were highly appreciated by readers. After the war Boris Rybakov published a number of books on the history and archaeology of ancient Russia. Miliza Nechkina authored a series of works about the Decembrists' democratic movement in the 1820s; Mikhail Tikhomirov collected and studied Russian medieval manuscripts; Nikolai Druzhinin researched democratic movements of Russia in the late nineteenth and early twentieth centuries. Important work was also done to compile collective historical works, such as the 16-volume *World History*, the 13-volume *Historical Encyclopaedia*, the 5-volume *History of Diplomacy*, and the 2-volume *History of Diplomatic Relations in the Pacific Ocean Region* (edited by Evgeni Zhukov and Aleksandr Guber). In addition, there were five separate editions of a 3-volume *Diplomatic Dictionary*, a 6-volume *History of the Great Patriotic War*, a 16-volume *History of World War Two*, and three editions of the voluminous *Large Soviet Encyclopaedia* edited by Aleksandr Prokhorov. Many scholars contributed to particular geo-cultural areas. There were Sinologists such as Vasili Alekseev, Japanists such as Nikolai Konrad, Indologists (Fedor Scherbatskoy); Arabists (Ifgnat Krachkovsky), Iranists (Evgeni Bertels), Mongolianists (Boris Vladimirtsov), and Africanists (Ivan Potekhin). Nicholas Roerich, the painter, philosopher and historian, and his wife Helen and their sons, Yuri and Sviatoslav, were New Age figures living mainly in India, who contributed to the cultural interaction of East and West.

Archaeologists discovered Palaeolithic and Neolithic sites along the migration routes from Siberia through the Chukot Peninsula and Bering Strait to America. Aleksandr Okladnikov discovered Neolithic settlements in the South Uralsand. B. Rybakov, together with specialists on Indo-European linguistics and toponymics, such as Oleg Trubachev, determined the habitat of proto-Slavic tribes, while Boris Piotrovsky discovered remains of an ancient Urartu civilization in Armenia. Old Russia texts on birch-bark were found during excavations by Artemy Artsikhovsky and Valentin Yanin in Novgorod, Pskov, Staraya Russa, and Tver. About 800 examples of these texts are known. Scythian burials preserved in the permafrost were discovered in the Pazyryk valley. Soviet archaeologists also carried on expeditions to the Nubian Desert (Boris

Piotrovsky), to Syria and Iraq (Rauf Munchaev), where they found settlements from the 7th millenium BC. In Central Asia archaeologists uncovered the site of Nissa, an important centre of the Parthian state, which existed from the third century BC and Neolithic settlements of 8000 to 7000 BC, excavated by Vladimir Masson. The great 20-volume *Archaeology of the USSR* was done under B. Rybakov's leadership.

In the 1980s the opening up of the previously closed state archives gave a great impetus to publishing new historical studies on the USSR and Russia.

## LITERATURE

In the years of the First World War several decadent and anarcho-nihilistic schools prevailed in Russian literature. The most important was a group of poets who were later described as representatives of the 'Silver Age' and included Anna Achmatova, Nikolai Gumilev, Boris Pasternak, Marina Tsvetayeva, and Konstantin Balmont. Some groups, the futurists for instance, demanded 'to throw down Pushkin, Dostoevsky, Tolstoy, from the ship of contemporaneity'. Such destructive tendencies survived in literature during the first years of Soviet power too, and Lenin had to state that Marxism did not give up the most precious achievements of the bourgeois epoch at all but, on the contrary, assimilated and absorbed everything valuable in its several thousand years' development of thought and culture. Speaking before the Young Communist's Congress Lenin emphasized that one can become a communist only having enriched one's memory with the knowledge of all mankind's treasures. In spite of these pronouncements, the ultra-left, nihilistic attitude towards literature and culture of the past was supported by some members of the Communist Party leadership, especially by followers of Leon Trotsky. In 1925 the Russian Association of Proletarian Writers (RAPP) was established. Its members declared their rejection of any cultural heritage of the past, and demanded the establishment of a 'hegemony of the proletariat' in literature. They divided writers into categories according to their class, and, criticized them fiercely as being 'bourgeois', or 'neo-bourgeois' authors. Similar ultra-left activities also affected the fine arts, theatre and cinema, but eventually the ultra-left tendency was condemned and overcome. The overwhelming majority of Russian intellectuals kept up with the traditional culture of the country. In 1932 RAPP was finally dissolved.

Russian poets and writers were among the first to recognize the Revolution: Vladimir Mayakovsky, Sergei Esenin, Aleksandr Blok, Valeri Bryusov, Fedor Gladkov, Konstantin Fedin, Marietta Shaginyan, Dmitri Furmanov, Veniamin Kaverin, Nikolai Tikhonov, Lidia Seyfulina, along with the Ukrainian Pavel Tychina, and the Belarussian Yanka Kupala. Their books influenced the literature of the next generation of writers. For example: Maxim Gorky's *My Universities* (1923) and *The Artamonovs' Business* (1925), V. Ivanov's *Armoured Train 14-69* (1923), D. Furmanov's *Chapaev* (1923), A. Seraphimovich's *Iron Stream* (1924), L. Leonov's *Badgers* (1924), I. Babel's stories, K. Fedin's *Towns and Years* (1924), F. Gladkov's *Cement* (1925). They influenced dramatists too: K. Trenev's *Lyubov*

*Yarovaya* (1926), V. Bill-Belotserkovsky's *Storm* (1930), and V. Vishvevsky's *The First Cavalry Army* (1930). Novels of note include A. Fadeev's *Defeat* (1927), M. Sholokhov's *The Quiet Don* (1928). Important works of the 1920s and 1930s include: M. Gorky's *The Life-Story of Klim Samgin* (1928–37), A. Fadeev's *The Last of the Udege* (1929–36), A. Panferov's *Bruski*, (1928–37), N. Ostrovsky's *How the Steel Was Hardened* (1932–34). The latter became very popular not only in our country but also abroad in China, Cuba and Viet Nam. A number of books explored the theme of industrialization: M. Shaginyan's *Hydrocentral* (1930–31), V. Kataev's *Time, Forward!* (1932), and F. Gladkov's *Energy* (1932–38).

The theme of collectivization of peasants was described vividly in M. Sholokhov's novel *Virgin Lands Cultivated* (1932), Ukrainian dramatist A. Korneichuk's *In the Steppes of the Ukraine* (1941), and the Belarussian Y. Kolas' *Drygva*.

Patriotic and historical themes were also depicted in a number of novels and epics, such as A. N. Tolstoy's *Peter I* (1929–33), S. Sergeev-Tsensky's *Sevastopol Toil* (1937–39), and A. Novikov-Priboy's *Tsushima* (1932–35).

From the position of critical realism Andrei Platonov's novel *Chevengur* should be mentioned, along with two stories by Mikhail Bulgakov, 'Dog's Heart' and 'Fatal Eggs', and Mikhail Zoshchenko, whose short stories mercilessly mocked ultra-left and philistine views.

In 1932, the Union of Soviet Writers was established. It united artists of various tendencies. The Union was headed by Maxim Gorky, who had already gained vast popularity before the Revolution and whose views had much in common with those of the Communists.

Stalin's purges of the 1930s inflicted many casualties among the literati: poet Osip Mandelshtam, dramatist Sergei Tretyakov, writer Isaak Babel, two representatives of the so-called 'peasant literature' – Nikolai Klyuev and Sergei Klychkov – and many others were brutally repressed.

After the Nazi invasion, one-fourth of the members of the Union of Soviet Writers joined the armed forces; during the next four years some 242 writers perished and more than 300 were awarded military decorations, some even becoming heroes of the Soviet Union. During the war years, well-known Russian, Ukrainian, Belarussian, Armenian, Georgian, Jewish, Latvian and other writers created patriotic works. Mussa Djhalil – a Tatar poet imprisoned and later executed by the Nazis – wrote a series of lyric patriotic verses while in his prison cell. Poems and verses by Nikolai Tikhonov, Vera Inber, Olga Bergolts, and the Kazakh bard Dzhambul were devoted to the heroic defence of Leningrad.

In post-war years the theme of the Patriotic War continued to capture the imagination of many writers, such as Konstantin Simonov, Oles Gonchar, Niktor Nekrasov, Vasili Grossman, Viktor Azhaev, and Emanuil Kazakevich. Boris Polevoy's *Tale of the True Man* – devoted to the hero-pilot A. Maresiev, who, despite two artificial limbs, returned to fight against the Germans – made a great impact on the youth.

The growth of conservative ideology in the post-war period severely affected Soviet literature. In August of 1947 the Central Committee of the Party published a directive against heterodoxy. After Stalin's death and official condemnation of his cult in 1956, there was short period of 'thaw' (named after

the title of a story by Ilya Ehrenburg). On the crest of public enthusiasm arose a new literature reflecting the true Soviet reality. In 1956 a well-known literary magazine, *Novy Mir* (New World), edited by the poet Alexander Tvardovsky, published the novel *Not by Bread Alone* by V. Dudintsev, which was aimed at Soviet conservatism and bureaucracy. In 1962, the same magazine issued the story *One Day in the Life of Ivan Denisovich* by Alexander Solzhenitsyn, about the Gulag prison camps. Works by Yuri Trifonov and Andrei Platonov, previously prohibited, were also published in this magazine. Many national newspapers published the verse 'Stalin's Successors', by Evgeni Evtushenko, where the author unmasked those who endeavoured to renew the dictator's cult.

At the same time, together with critical verses by such young poets as Robert Rozhdestvensky, Andrei Voznesensky and Bella Akhmadulina, there appeared in the 1960s and 1970s a voluminous underground literature, called *samizdat*. These unpublished manuscripts and critical works had been rejected by state publishing houses and were circulated clandestinely using photocopies. Different unofficial magazines sprang up; they became famous due to the publication of letters and articles by physicist Andrei Sakharov, who advocated a policy of convergence and that his countrymen borrow the positive aspects of both capitalism and socialism. Historian Roy Medvedev sharply criticized the defects of Soviet democracy and the suppression of 'dissidents' – people who demanded reforms and democratization of the society.

Soviet literature in the twentieth century was multinational and polylingual. During the 50 years between the 1930s and 1980s, 'social realism was the prevailing official art form. It sought to portray a true picture of daily life using a variety of forms and genres that corresponded to the requirements of the national character, Party spirit and social humanism.

During the Soviet period some of the best-known literature – including ancient texts – produced by the different nations of the USSR was 'discovered' when it was translated into Russian. This included books by Ukrainian writers Taras Shevchenko, Ivan Franko, Lesia Ukrainka, Mikhail Kotsyubinsky, Pavel Tychina and Maksim Rylsky; works by the twelth-century writer Nizami Gianjevi, Muhamed Fizouli (fifteenth century), Mirza Akhundov, Sabir Tairzade (Azerbaijan); Alisher Navoi (Uzbekistan); Abu Rudaki, Abulkasim Ferdousi (Tajikistan); Ovanes Tumanyan, Mikhail Nalbandyan, Gabriel Sundukyan (Armenia); the Georgian medieval poem 'Knight in Panther-Skin' by Shota Rustaveli; D. Guramishvili, I. Baratashvili, A. Chavchavadze, A. Tsereteli, Vazha-Pshaveli (Georgia); Makhtumkuli (Turkmenia); Abai Kunanbaev (Kazakhstan); Y. Rainis, A. Upit (Latvia); I. Donelaitis, Y. Zhemaite (Lithuania); I. Kringe (Moldavia). Y. Kupala, Y. Kolas, M. Bogdanovich, F. Bogushevich (Belarus); K. Khetagurov (Ossetia); and the classics of Jewish literature by Sholom Aleikhem, among many others. Many nations of the country that hadn't possessed written languages before the Revolution (Kirghizes, Buryats, Maris) were able to develop their national literatures as did those whose languages were finally written in the 1920s and 1930s (Tuvinians, Adygeis, Nanaians, peoples of the North).

The following authors were accorded anniversary celebrations in Moscow and other big cities: Aleksandr Pushkin, Shota Rustaveli, Nikolai Dobrolyubov, Nikolai Nekrasov, Mikhail Kotsyubinsky, Ivan Franko, Lesia Ukrainka, Kosta Khetagurov. Such events helped promote the literary treasures of the different peoples of the Soviet Union.

Outside the country the following expatriate authors should be noted: Ivan Bunin (Nobel Prize of 1933), Vladimir Nabokov, Decadent writers Dimitri Merezhkovsky and Zinaida Gippius, and Marina Tsvetaeva, who returned to the USSR in 1939. In 1974, Solzhenitsyn (Nobel Prize for 1970) was forcefully deported from the country and returned to Russia only in 1995. In the late 1970s, the poet Joseph Brodsky (Nobel prize of 1987) had to leave the country for the USA.

## MUSIC, BALLET, FOLK ENSEMBLES

The 1920s was a fertile period for composers. Nikolai Myaskovsky created his new symphonies, Reingold Glier composed a historical musical poem called 'Zaporozhians' and the ballet *Red Poppy*, Alexander Glazunov wrote his string quartet, and Mikhail Ippolitov-Ivanov created orchestral suites and symphonic poems. This tradition was extended by Mikhail Glinka, Alexander Borodin, Modest Musorgsky, Nikolai Rimsky-Korsakov and A. Skriabin. Music was also developing in the various Soviet republics: in Ukraine, the second symphony by Lev Revutsky, creation of the 'Dumka' choir, composition of choral works by Nikolai Leontovich; in Georgia, Zakhari Paliashvili and Meliton Balanchivadze; in Armenia, Aleksandr Spendiarov. State musician collectives were also organized: the Russian Folk Choir conducted by Mitrofan Pyatnitsky, the Red Army Ensemble of Song and Dance under the leadership of Aleksandr Aleksandrov, and numerous chamber music ensembles.

Prokofiev, who returned to the Soviet Union from abroad in 1932, composed many of his best-known works during this period: *Romeo and Juliet, Peter and Wolf, Alexander Nevsky*, and Dimitri Shostakovich wrote his 5th symphony and beautiful piano quintet in 1936; however, he was criticized by the authorities for the 'formalism' of his music. Armenian composer Aram Khachaturyan wrote his ballet *Gayane* and various symphonic and piano works; Boris Asafiev composed the ballets *Bakhchisarai Fountaim* and *Flames of Paris*, while Nikolai Myaskovsky continued to work on his symphonic cycle.

The pre-war period also saw much musical activity in the Soviet republics. Composers of note include: Useir Gadzhibekov and Abdul Magornaev (Azerbaijan); Armen Tigranyan (Armenia); Anatoly Bogatyrev, Evgeni Tikotsky and Victor Kosenko (the Ukraine).

Working alongside these musicians of the old generation were a number of young and talented performing artists: Konstantin Igumnov, Aleksandr Goldenveizer, Genrich Neigaijz, Vladimir Sofronitsky, David Oistrakh, Marina Yudina, Petr Stolyarsky, Abram Yampolsky, Semen Kozolupov, Emil Gilels, Yakov Flier, Marina Kozolapova, Galina Barinova and Daniel Shafran.

Popular opera singers of the time included: Leonid Sobinov, Valeria Barsova, Antonina Nejdanova, Dormidont Mikhailov, Ivan Kozlovskiy, Sergei Lemeshev, Feodor Chaliapin, and Pavel Andreev.

During the war years, many composers focused on patriotic and lyric songs: Vasili Soloviev-Sedoy, Boris Mokrousov, Anatoly Novikov, Aleksandr Aleksandrov and Matvey Blanter. After the war, the following composers were active: Rodion Shchedrin, Boris Chaikovsky (Russia); Kara Karaev, Fikret Amirov (Azerbaijan); Otar Taktakishvili, Sulhan Tsintsa-dze (Georgia); Arno Babadzhanyan (Armenia); Veli Mukhatov (Turkmenistan); Aleksandr Sveshnikov, Platon Maiboroda, Grigory Verevka (Ukraine); and Russians Alfred Shnitke, Georgi Sviridov, Isaak Dunaevsky, N. Strelnikov and Y. Milyutin.

Composers and conductors of the Soviet Baltic republics continued to develop their national traditions: A. Lepin, Adolf Skulte, Yanis Ivanov, Margers Zarinsh, Y. Medynsh, Alfred Kalnynsh, and Raimond Pauls. In Lithuania there were Anastas Rachyunas, Yuri Nuzelyunas, Yuri Tallat-Kyalpsh, B. Dvarionas and Stasis Vainyunas. In Estonia, one should mention the composers and conductors Gustav Ernesaks and Artur Kapp. The list of gifted ballet dancers would include: Ekaterina Geltser, Galina Ulanova, Olga Lepeshinskaya, Natalia Dudinskaya, Marina Semenova, Vakhtang Chabukiani, Konstantin Sergeev, Askold Makarov and of ballet masters: Leonid Lavrovsky, Igor Moiseev, Agrippina Vaganova, Yuri Grigorovich and Kasian Goleizovsky. Foreign audiences became acquainted with many Russian and Soviet artists who lived or travelled abroad: composers Sergei Rakhmaninov and Igor Stravinsky; singer Feodor Chaliapin; ballerina Anna Pavlova; dancers Vaslav Nijinsky, Mikael Baryshnikov and Rudolf Nureyev; choreographers George Balanchine and Sergei Diagilev (who organized the Russian Ballet company in Paris); musicians Vladimir Horowitz, Yahudi Menuhin, Lev Oborin, Leonid Kogan, Mstislav Rostropovich, Yuri Bashmet, Vladimir Spivakov, Sviatoslav Richter; singers Dimitri Khvorostovsky, Evgeni Nesternko, Elena Obraztsova; ballerinas Galina Ulanova and Maya Plisetskaya, and conductors Evgeni Svetlanov and Evgeni Mravinsky.

## THEATRE

After the Revolution the government offered assistance to theatres throughout the Soviet Union, and wherever performances were given in national languages.

Besides preserving the traditions of Russian theatres like the Moscow Art Theatre (founded in 1898 by Konstantin Stanislavsky and V. Nemerovich-Danchenko), the Maly Theatre in Moscow, and others in Petrograd and Kiev, new theatres also opened. In 1920–21 the first professional theatres for children were established: the Drama Theatre for Children headed by A. Bryantsev in Petrograd, a musical theatre for children in Moscow (N. Sats), and in 1931, the Central Puppet Theatre (S. Obraztsov).

Performances of the Bolshoi Theatre in Moscow and Mariinsky Theatre in Petersburg, the Theatre of Opera and Ballet in Ekaterinburg, playhouses in Moscow (MHAT and Maly), the Taganka Theatre (Y. Lyubimov), Lenkorn Theatre (M. Zakharov), and the Sovremennik Theatre (G. Volchek), had broad recognition.

The Moiseev Folk Ensemble and the Soviet (Red) Army Choir both toured successfully all over the world, as did many circuses.

## FINE ARTS

Historic and revolutionary themes were reflected in pictures painted by Isaak Brodsky, Mitrofan Grekov, Aleksandr Gerasimov, Boris Kustodiev, Konstantin Yuon, Kuzma Petrov-Vodkin and others during the 1920s. Petr Konchalovsky and Igor Grabar worked in the landscape genre. Newspaper and magazine caricaturists of note included: Dimitri Moor, Viktor Deni, Boris Efimov and Lev Brodaty. A creative group of painter-satirists was formed under the pseudonym Kukryniksy (Mikhail Kupriyanov, Porfiry Krylov, Nikolai Sokolov). The names of Vladimir Favorsky, Aleksandr Kravchenko, and Pavel Pavlinov are connected with block prints.

In the early 1920s art organizations of the ultra-left such as the Russian Association of Proletarian Painters appeared. Being advocates of abstract art and committed to change, they wanted to give up all the art of the past. All of these groups were dissolved in 1932. In the 1930s the portraits by Mikhail Nesterov, Igor Grabar and Aleksandr Gerasimov were widely acknowledged. Martiros Saryan and Sedrak Arakelyan were popular in Armenia, Aleksandr Shovkunenko and Nikolai Samokish in the Ukraine, and Valentin Volkov in Belarus. Well-known book illustrators included: Demian Shmarinov, Evgeni Kibrik, Aleksandr Gerasimov, and Aleksandr Kanevsky.

In the war years the tradition of ROSTA Civil War posters was renewed: 'TASS Windows' appeared with stencilled posters painted by such artists as P. Sokolovsky, N. Radlov, M. Savitsky, and Kukryniksy. The most famous of these were created by D. Shmarinov ('No Oblivion, No Pardon'), A. Pakhomov ('Leningrad in the Days of Blockade'), and A. Kurdov ('On the Roads of War').

Military themes, portraying rank-and-file soldiers and famous generals, continued to be popular, as represented by M. Grekov. Portraitists included P. Korin, A. Shovkunenko, M. Bozhy and G. Stronka.

R. Treuman (Estonia), I. Glazunov and A. Shilov are well known today.

In the field of decorative art, probably the best-known crafts are the lacquered boxes and painted miniatures from the little towns of Palekh, Mstera, Fedoskino and Kholui. Glass, porcelain, wood, mosaic, metal-working, macramé and carpets are other examples of applied arts.

A number of major Russian painters made names for themselves abroad after the Revolution, among the founders of abstract art, including Kasimir Malevich and Vassili Kandinsky. Alexander Benoua and Marc Chagall also achieved international prominence.

Nicolai Andreev's sculpted monuments to A. Hertsen and N. Ogarev in a realistic style in front of Moscow University were among the first works of sculpture between 1918 and 1920. Ivan Shadr created a number of busts of ordinary people in 1922, a work of sculpture named *A Cobble-Stone as a Tool of the Proletariat* and a monument to Lenin in 1927. Later on such sculptors as Matvei Manizer, Sergei Mercurov, Nikolai Tomsky and Lev Kerbel also devoted their energy to creating images of Lenin.

A sculpture titled *Workman and a Collective-Farm Womam* by Vladimir Mukhina was presented during the 1937 World's Fair in 1937. Among contemporary sculptors the name of Ernst Neizvestny – who designed the memorial to the martyrs of Stalin's terror in Magadan – should be mentioned.

## ARCHITECTURE

In 1922, Vladimir Shukhov created a 148-meter-high hyperboloid radio mast in Moscow that is now used for TV and radio transmission. B. Yofan designed the Soviet pavilion at World Fairs in Paris and New York in 1939. A number of architectural designs are associated with the industrialization of the 1930s. Among these are: the Dnepr hydroelectric station and dam, steel mills in Magnitogorsk and Kuznetsk, and various tractor, bearings, and chemical plants, and public housing and sports facilities. In 1930 a granite mausoleum was built for Lenin in Moscow's Red Square according to plans drawn up by Aleksei Shchusev. Shchusev and other leading architects such as Ivan Zholtovsky, Ivan Fomin and Vladimir Gelfraigh worked on many urban projects in Moscow, Leningrad and other cities. New bridges were constructed over the Moscow River during 1936–38. Some stations of the Moscow underground were built during the 1930s and 1940s. In 1933 a 227-km-long channel from Byelomor to the Baltic was completed with the use of forced labour.

Reconstruction of towns, cities and industrial enterprises devastated by German troops was carried out throughout the post-war period, and highrise construction was beginning in Moscow. Erected in 1967, Moscow's Ostankino TV and BC Tower is the second-tallest free-standing building in the world. It has a structural weight of over 55,000 tons.

A large memorial complex can be seen in the Treptov Park of Berlin. There is a 13-metre-high bronze statue: the Soviet soldier holds a small girl and, in his right hand, the sword with which he has broken the Nazi swastika. It was conceived by E. Vuchetich and built by a group of architects from Moscow and Kiev. E. Vuchetich also sculptured a *Statue of the Motherland* on Mamaev Barrow in Volgograd.

Apartment house building began in a number of cities and towns in the late 1950s. A mass housing construction project of five-storied small-flat buildings with a simplified layout managed to relieve the housing crisis for a while. In 1995 a memorial museum of the Great Patriotic War of 1941–45 was opened in Moscow on Poklonnaya Hill. An orthodox church, a mosque and a synagogue were built nearby in commemoration of the war's victims. Construction of Christ the Savior Cathedral was finished in Moscow in 1997; it is the exact copy of the old cathedral blown up in 1934.

## SPORTS

In 1939, the government endorsed the initiative of youth organizations to build an All-Union sporting complex to be 'Ready for Labour and Defence' (GTO). By 1956 more than four million people had trained and met their certification requirements in GTO. Since 1952 Soviet athletes have been taking part in the Olympic Games and set many records, thanks to the support of the state.

The Soviet chess-players' school became widely known all over the world and produced a number of world champions: Aleksandr Alekhin, Mikhail Botvinnik, Mikhail Tahl, Vasili Smyslov, Tigran Petrosyan, Anatoly Karpov, and Garry Kasparov.

## CINEMA

The development of the Soviet cinema is connected with the names of such old masters as Y. Protozanov and S. Yutkevitch. Historic films include Sergei Eisenstein's *Battleship Potemkin* (1925), *October* (1927), *Alexandr Nevsky* (1938), and *Ivan the Terrible* (1945–58); N. Ekk's *A Start in Life* (1931); F. Ermler and S. Yutkevich's *Counter Plane* (1932); the Vasilievs brothers' *Chapaev* (1934); V. Pudovkin's *The Mother* (1926); A. Dovzhenko's *The Arsenal* (1923) and *The Land* (1930); F. Ermler's *The Fragment of Empire* (1929); G. Kozintsev and L. Trauberg's *Maxim's Youth* (1935); E. Dzigan's *We are from Kronstadt*; M. Romm's *Lenin in October*; and G. Alexandrov's *Merry Fellows*, *The Circus*, and *Volga-Volg*. S. Gerasimov and M. Donskoy were successful at shooting screen versions of works by Leo Tolstoy, Anton Chekhov and William Shakespeare.

Andrei Tarkovsky's great lyrical film, based on the life of the icon painter, *Andrey Rublev* is considered a masterpiece. S. Bondarchuk succeeded in creating mass battle scenes and was also known as a actor. Among the masters of documentary cinema should be mentioned R. Karmen, who shot films of the Civil War in Spain and Sino-Japanese War of 1941–45. Many brave cameramen shot historic epic scenes of the battle from the front.

There were many popular actors who achieved fame in the cinema: Boris Babochkin, Boris Chirkov, Boris Shchukin, Nikolai Okhlopkov, Kyubov Orlova, Vera Maretskaya, Tamara Makarova, Nikolai Kryuclikov, Marina Ladynina, Nikolai Cherkasov, Mikhail Zharov, Nikolai Mordvinov, Rostislav Plyatt, Evgeni Leonov, Anatoli Papanov, Yuri Nikulin, Nikolai Simonov, Yulia Borisova and others. Cinema was also developing in the Ukraine (A. Dovzhenko's films), in Georgia (N. Shengelaya, N. Chaurelli), and in Armenia (A. Bek-Nazarov). Famous composers who wrote for the cinema include: Isaac Dunaevsky, Dimitri Kabalevsky, Sergei Prokofiev, Aram Khachaturyan, Tikhon Klirennikov, and Dimitri Shostakovich.

Throughout the post-war years film-making studios were established in the Latvian, Lithuanian and Estonian Soviet Socialist Republics, which did not have their own cinema before. All together thirty-three studios were working in the Soviet Union by the middle of the 1980s. Since the late 1940s there has been cartoon-making and cinema for children. Many Soviet films, beginning with Eisenstein's 1927 masterpiece *Battleship Potemkin*, are recognized as masterpieces by audiences the world over.

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# 31.2
## EAST-CENTRAL AND SOUTH-EAST EUROPE

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The 1917–1919 revolutions in Russia, Germany and Austria-Hungary as well as the victory of Great Britain, France and the USA in the First World War were determining factors in the new Versailles system of international relations in Eastern and Central Europe. Independent Austria, Hungary and Czechoslovakia were formed on the ruins of the Habsburg Empire. Romania, including Transylvania, was constituted within its borders. The unification of independent Serbia and Montenegro with the territories that had been part of former Austria-Hungary resulted in the creation of the multinational Kingdom of Serbs, Croats and Slovenians (known after 1929 as Yugoslavia). An independent Polish state was resurrected after a hundred years of non-existence.

### EDUCATION AND CULTURE

Historically East-Central Europe and the Balkans reveal sharply contrasting education and communication systems, as well as different levels of scientific progress and intensities of cultural life. For instance, what is today the Czech Republic was the most industrially developed part of the Habsburg Monarchy during the nineteenth century. Reforms of the late eighteenth and early nineteenth centuries put an end to illiteracy, whereas in the 1920s and 1930s, the illiterates in Romania and Yugoslavia came to 40 and 50 per cent respectively, and in Albania to more then 80 per cent. Founded in the fourteenth century, the universities of Prague, Vienna and Krakow for centuries played the role of academic centres, whose reach extended well beyond national borders. In contrast, the first university in Bulgaria was founded only in the 1880s, and in Albania there were no institutions of higher education until after the Second World War. Whereas in Poland theatres flourished already in the seventeenth-century baroque era, in Bulgaria the national theatre culture was not even formed until the early twentieth century, when the National Theatre in Sofia was founded. Residents of Prague had an opportunity to listen to Mozart and Beethoven. On the other hand, the first permanent operatic company in Belgrade dates from 1920, and in Sofia from 1921. In the inter-war period the Czech film studio Barrandov was recognized as being among the most technically advanced in Europe, while in the Balkan countries during the same period the cinema was in an embryonic state. There were also sharp contrasts between the cultural development of different lands within one particular state, as in Austria-Hungary, which finally broke apart in 1918. For ages Prague was not only a centre of Czech culture, but also an important centre of Austro-German culture. In Bosnia, on the other hand, the building of modern cultural infrastructure started only after the country had been annexed by Austria-Hungary in 1908.

These deep historical and cultural differences between East-Central Europe and the Balkans go back as far as the early Middle Ages. The choice between the Catholic Church and Greek Orthodoxy, between the spiritual orientation of Rome or Constantinople, helped determined the character and the way that different European nations were fitting into the world. For example, although Serbs and Croats speak the same languages their religious differences profoundly influenced the process of nation building.

Turkish expansion in the Balkans in the fifteenth to seventeenth centuries was another important factor influencing the development of the two regions. The border between the Ottoman and the Habsburg Empires became the border between two cultures. Long dependence (up to the nineteenth century) upon the Turks, and a tradition of anti-Ottoman liberation movements contributed to the unique historical experience of the Balkan nations. In the present day Balkans, in Bosnia and parts of Bulgaria one can find enormous areas settled by Muslims.

In the nineteenth century, formation of the Czech, Slovak, Croat, Slovenian nations and national cultures in Central Europe was guided by emancipation from the dictates of language – either German or, in the case of the Croats and Slovaks, Hungarian. The process was most successful in the Czech lands, where by 1918 not only were the preconditions for nation statehood already in place, but also for the forming of one of the most advanced political systems in inter-war Europe.

The problems of defining what was the historical specificity of 'Central Europe' and what were its borders are

still controversial (let us mention only the concepts of Jenő Szűcs and Milan Kundera). Certainly Austria belonged to this region, and Habsburg and Vienna played the role of 'bridge to Europe', offering a region-wide cultural centre attracting the representatives of different national cultures (the same role played by such other big cities as Prague or Budapest). German cultural influence should also be mentioned, with its very ambivalent attitude. Besides German culture one should pay tribute to the trans-national significance of Jewish culture. The Jews in Central Europe formed a very creative cultural community whose role has spread far beyond national or regional borders.

Austrian culture, which had always developed in a close interaction with Hungarian and Slavonic cultures, gradually emerged as a culture in its own right, consolidating its specific national features. One can find them already in the second half of the eighteenth century in the music of Josef Hayden and Wolfgang Amadeus Mozart, and then in the first half of the nineteenth century in the music of Franz Schubert, the dramaturgy of Franz Grillparzer, Ferdinand Raimund or Johann Nepomuk Nestroy, and the poetry of Nikolaus Lenau. Austrian nationalism and identity, expressed both in philosophy and the different branches of creative activities, were sometimes caught between the quest for truth in a material world and an attempt to harmonize itself with the transcendental German idea of *Geist*. Austria's failure to become the centre of German unification, Prussia's ousting of Austria from the process of German unification in the 1860s and, finally, the formation of the German Empire in 1871 accelerated the crystallization of Austrian national consciousness (though up to the second half of the twentieth century the majority of Austrians put their German identity before their Austrian one). The sharpness of national and social antagonisms in Austria-Hungary probably intensified the spiritual search in Austro-German culture at the turn of the century. Austria became the native soil for a number of important teachings in European philosophy: Sigmund Freud's psychoanalysis, Edmund Husserl's phenomenology, Rudolf Kassner's physiognomy, Martin Buber's mystical Judaism, Theodor Herzl's philosophical doctrine of Zionism and Ludwig Wittgenstein's analytic philosophy. Each of these made a long-term impact on twentieth-century culture.

From the first decades of the twentieth century Austrian literature entered its Golden Age. Traces of neo-romanticism and symbolism could be found already in the works of Hugo von Hofmannsthal and Arthur Schnitzler. Rainer Maria Rilke, one of the greatest German-language poets of the twentieth century, evolved from impressionism through philosophical symbolism to the 'new subjectivity'. The works of Georg Trakl, Franz Werfel and Gustav Meyrink gave an impetus to the rise of expressionism. Franz Kafka's prose significantly broadened the scope of twentieth-century literature. The crisis and downfall of the Habsburg Monarchy turned Austria into a small country, an event perceived as a tragedy in the national consciousness. This found expression in the world-famous works of Robert Musil, Josef Roth, Hermann Broch, Stefan Zweig and Heimito von Doderer, and such dramatists as Ödön von Horváth and Franz Teodor Csokor. Inter-war Austria was depicted with great talent in the works of the Nobel Prize winner Elias Canetti, who showed how the nation was gradually shifting towards fascism and the *Anschluss* union with Hitler's Germany.

During the twentieth century, Vienna – the city of Mozart, Beethoven, Brahms, Mahler and Strauss – maintained its former stature as a world centre of musical culture. The new Viennese school, namely Arnold Schönberg, Alban Berg and Anton Webern, reformed the musical language by promoting principles of atonality and dodecaphony. Austria gave the world a number of celebrated performers, and one of the greatest conductors of the twentieth century, Herbert von Karajan.

In architecture, the Austrian secession, and in applied arts and painting the creations of artists like Gustav Klimt turned from a local phenomenon into something of international significance. But already before the First World War architecture was turning towards rationalism as a reaction to art nouveau's ornamentalism and fluctuating forms. The new era gave rise to expressionism (Oskar Kokoshka), which became the dominant movement both in German and Austrian painting. If in the Austrian national consciousness the results of the war were associated with the downfall of Austrian greatness, for Czechs and Slovaks the dissolution of the Habsburg Monarchy became a precondition for Czechoslovak statehood. Not only its democratic form of government, but also the country's position at the crossroads of different cultural trends created favourable conditions. Traditional cultural links with German culture were preserved. At the same time the Francophile political orientation of Czechoslovakia's first president, Tomáš G. Masaryk, promoted French cultural influences especially in the fine arts. On the other hand, Prague became one of the main cultural centres of the Russian emigration. Russian scholars like Roman O. Jakobson, Nikolai S. Trubetskoy and P. G. Bogatyriov together with Czech scholars Jan Mukařovsky and Vilém Mathesius played a leading part in the Prague linguistic circle, which contributed to the development of structural linguistics, phonology and poetics.

In the inter-war period Czech literature blossomed with Jaroslav Hašek's satirical prose and Karel Čapek's social fantasies. Czech poetry was very innovative. The principles of 'poetism' and surrealism, maintaining the priority of free association in figurative thinking compared to didacticism and rationality, was theoretically motivated in the internationally supported essays of Karel Teige. These principles strengthened the metaphorical side of poetic language, and its expressive abilities were differently interpreted by such talented poets as Vítězslav Nezval, Vladímir Holan, František Halas, the future Nobel Prize winner Jaroslav Seifert, the Slovak poet Laco Novomeský and others.

Leading theatre directors like Jindrich Honzl and E. F. Burian were searching after new ways of scenic expression. Their works combined satire and the grotesque with elements of stylization and a quest for new musical rhythms.

In the 1920s and 1930s Czech musical culture developed through the compositions of Bedřich Smetana, Antonín Dvořák and Zdeněk Fibich, a time when such older generation composers as Leoš Janáček and Josef Boguslav Foerster were in their heyday. The world famous composer Boguslav Martinů lived abroad but did not break off relations with his homeland. Alois Hába, one of the authors of the quartertone system, was probably the most famous representative of the Czech musical avant-garde. In the 1920s and 1930s in the fine arts the use of the artistic

experience of post-impressionism, expressionism, cubism and fauvism was combined with an interest in folk idioms. The rich traditions of Central-European art nouveau – initially represented by the Viennese secession – were alive in the drawings of Max Švabinský, in the versatile masterpieces of Alfons Mucha, and in the easel-painting and monumental frescoes of Jan Preisler. The painter Emil Filla was strongly influenced by expressionism and later cubism. The sculptor Jan Štursa, in his expressive, dynamic compositions, was influenced by the work of French sculptors Aristide Maillol and Émile Antoine Bourdelle. Brilliant sculptural works of Otto Gutfreund were created under the influence of expressionism and cubism. The great master of illustrations Josef Lada and the painter Václav Špála demonstrated their deep interest in folk art. The painter and pencil artist František Kupka paved new ways in art, gradually shifting from social realism towards abstractionism and non-figurative art. In the 1930s as the fascist threat gained ground in Europe, dramatic themes sounded more and more distinctly in the works of many leading Czech artists. Surrealism became one of the most popular styles, as exemplified by the tragic passion of J. Síma's works.

Czech architects in the inter-war period not only absorbed modern German, French or Dutch influences, but also influenced architects from different countries by their constructivist and cubist experiments in architecture. Among the leading representatives of the twentieth-century Czech architectural school one should mention Jan Kotěra, J. Gočár, P. Janák, K. Honzik, J. B. Fuchs and J. Kroha. In industrially developed and democratic Czechoslovakia there were better conditions for big projects of urban development than in other East-Central European countries, even though many projects were never realized. E. Hobsbawm's famous definition of the twentieth century as 'the age of extremes' is especially true when we speak about inter-war Czechoslovakia, where leftist, socialist tendencies were very strong, and many celebrated artists were drawn to the communist movement. Although the Moscow trials of 1937–38 were condemned by many left-wingers there was philosophical opposition to those artists devoted to the communist ideals from both the partisans of liberalism, and conservatives recruited from among Catholic writers, such as Jan Zahradíček and Jaroslav Durych. Generally speaking, in Czechoslovakia as elsewhere in Europe of the 1920s and 1930s, the artists were deeply involved in ideological battles concerning, for instance, their attitude towards the socialist experiment in the USSR. T. G. Masaryk's Czechoslovakia held first place in Europe not only in the fine arts, but also in education and science. There were noteworthy schools in mathematics, chemistry (Bohuslav Brauner's school), and humanities, Slavonic and comparative linguistics, medieval studies, art history and ethnology. Lubor Niederle's works on the archaeology and early history of Slavs are well known all over the world. Bedřich Hrozný deciphered Cuneiform Hittite and established that the Hittite language belonged to the Indo-European group.

Though the political system in Czechoslovakia – the embodiment of Tomáš Masaryk's political ideas – was very democratic, there was no real equality in rights for different nationalities. Slovakia and Trans-Carpathian Ukraine played the role of agrarian satellites of the highly industrialized Czech lands; living conditions there were much worse, and educational standards much lower than in

other parts of the country. Adherents of the officially supported concept of 'Czechoslovakism' regarded the Slovaks as an integral part of a single Czechoslovakian nation. This could not but affect cultural policy. It is noteworthy that up until the 1930s the main repertoire of the Slovak National Theatre (founded in Bratislava in 1920) was performed in Czech. Nevertheless, after the downfall of Austria-Hungary and the birth of the independent Czechoslovakia conditions for Slovak national culture improved. The Slovak university named after Jan Amos Komenský (Comenius) and the Slovak National Museum, both in Bratislava, played a great part in cultural life. National schools in painting (L'udovit Fulla and others) and music were formed. National literature flourished (Janko Jesenský, Ivan Krasko and others).

Both in Czechoslovakia and Poland, restoration of national statehood created better cultural conditions. At the same time there was a certain continuity with the previous period. Earlier, when the Poles had been deprived of their national statehood, culture was the main factor in preserving national identity in the partitioned country. The reborn state liberated creators from having to shoulder patriotic obligations so they could devote themselves more fully to formal experiments. Hence the importance of the avant-garde in the 1920s and 1930s. The entire work of Stanisław Ignacy Witkiewicz – an artist, novelist and dramatist who earned his fame posthumously – challenged Polish nationalism. At the same time continuity with the previous stage was preserved. Those artists who had played a part in the age of the 'Young Poland' (1890–1918), such as the realistic prose writers Stefan Żeromski, Kazimierz Przerwa Tetmajer and Stanisław Przybyszewski, poets Leopold Staff and Bolesław Lesmian, painters Leon Wyczółkowski, Olga Boznańska, Wojciech Weiss and others continued with their creative activity after their homeland found independance. In 1924 the Nobel Prize for literature was awarded to Władisław Stanisław Reymont, as earlier it was awarded to Henryk Sienkiewicz in 1905.

A positivist strain in Polish culture originated in the 1860s and 1870s but found further expression in the period between the wars. The Lvov-Warsaw neo-positivist school of Tadeusz Kotarbiński, Alfred Tarski, Jósef Łukaszewicz, Kazimierz Ajdukiewicz and others contributed to different branches of knowledge: logical semantics, epistemology, methodology of deductive sciences. The basis of mathematical logic, worked out by the representatives of the school, stimulated progress in mathematics. Especially important are the names of Wacław Sierpińsky, Żymund Janiszewski, Stefan Mazurkiewicz, Stefan Banach and Hugo Steinhaus, who helped to develop modern functional analysis, the theory of orthogonal series, and made innovations in the theory of measure and integration.

At the same time romantic nationalism in Polish culture was still alive and acquired new features. The great composer Karol Szymanowski combined Frederic Chopin's traditions with later innovation in musical language. The international prestige of Polish music was also confirmed by the recognition shown such celebrated performers as the conductor Gregory Fitelberg, pianists Ignacy Paderewski, Leopold Godowski and Jósef Hofman, the violinist Pavel Kochański, and singers Ewa Bandrowska-Turska and Jan Kiepura, who toured the world. The 1930s witnessed the debut of Witold Lutosławski, one of the greatest composers of the second half of the twentieth century. Also undeniable

was the success of Polish ballet: the choreographer Bronisĺawa Nijinska, sister of the famous Ballets Russes dancer Vaslav Nijinsky, worked in Warsaw in the 1930s and contributed to Sergei Diaghilev's Ballet Russe.

The traditions of the Russian theatre were kept up in inter-war Poland by Stanisĺawa Wysocka, Stefan Jaracz, Aleksander Zelwerowicz, Juliusz Osterwa and others. Many of them had worked in Russia before 1918. The neo-romantic style of Stanisĺaw Wyspiański, a key figure of the Young Poland movement that flourished between 1890 and 1914, was developed by the celebrated theatre director Leon Schiller, who sought to synthesize different arts in his theatrical performances.

Witold Gombrowicz and Bruno Schulz, together with Witkiewicz, were paving new ways in literature. Their prose is well known beyond Polish borders. Jarosĺaw Iwaszkiewicz, Zofia Naĺkowska and Maria Dąbrowska wrote in a more traditional, realistic and psychological manner. Polish poetry was characterized by a variety of styles. The group Skamandr (Julian Tuwim and others) was developing classical traditions in a wider sense of the word, including experience drawn from Young Poland artists with their neo-romantic aesthetics. On the eve of the Second World War apocalyptic presentiments were expressed in the lyrics of Konstanty Idelfons Gaĺczyński, Jósef Czechowicz and Meczysĺaw Jastrun. Nobel Prize winner Czesĺaw Miĺosz, the greatest Polish poet of the second half of the twentieth century, had also debuted in the 1930s.

Many opposing tendencies coexisted in the Polish fine arts scene. As in Czechoslovakia, strong French influences were combined with the quest for national elements. The group of formists (Tytus Czyżewski and others) followed the principles of cubism and were influenced by expressionism. Some of its members, such as Zbigniew Pronaszko and Leon Chwistek, were moving to abstractionism and non-figurative art. Others, for example Jan Cybis, searched after new colourist effects. Wĺadisĺaw Skoczylas was the pioneer of Polish xylography or wood engraving. In Tadeusz Makowsky's genre painting there were both cubist elements and naive art. Original interpretations of expressionist experience were characteristic of Felicyan Kowarski in his monumental and socially acute works. The main figure of Polish sculpture from the 1910s to the 1960s was Ksavery Dunikowski, whose works tended to celebrate the heroic and moral values.

Before 1918 Poland was partitioned between the three empires, each with its own educational system and cultural institutions. After the reconstruction of the Polish state there was a great deal of work to standardize education and culture. New universities, polytechnics and high schools were founded. Progress in sciences was closely interwoven with progress in higher education. Besides mathematics, Polish scientists achieved success in physical chemistry (the school of Wojciech Świętosĺawski), experimental physics, physics of low temperatures, thermodynamics, optics, electrochemistry, biochemistry, aerodynamics, empirical mechanics, astronomy and a number of medical disciplines. There was also significant progress in economics, social sciences, ethnology and archaeology. Since history traditionally played an important part in the formation of the national consciousness, history faculties at the universities accumulated great numbers of talented historians. Another prerequisite of national consciousness was language; the problem of its preservation, which was so

acute in partitioned Poland, stimulated progress in linguistics. The works of Jan Baudouin de Courtenay were of great significance for phonology. There was also some progress in Slavonic linguistics, namely dialectology (Kazimierz Nitsh) and comparative indo-europeistics.

Krakow University was an important centre of neo-Thomistic philosophy. Besides the Polish school of neo-positivism there was Roman Ingarden's phenomenological aesthetics. Floryan Witold Znaniecki became one of the founders of empirical sociology. Janusz Korczak contributed pedagogy. Many Polish scholars became famous working abroad: the physicist and chemist Maria Skĺodowska-Curie, who was twice awarded the Nobel Prize, her colleague Kazimierz Fajans, and Bronisĺaw Malinowski, noted for his anthropological theory of functionalism.

In the 1930s, with the growing threat from German fascism, Polish intellectuals were faced with three options: nationalism, liberal democracy or communism. The struggle among the advocates of these three competing tendencies determined the spiritual climate of the Second Republic, especially in the last years of its existence.

The deep contradictions in Polish cultural life in the inter-war period expressed themselves in the disproportion between the high level of scientific progress, elitist schools and artistic culture on the one hand, and cultural backwardness of the popular masses on the other. Some 20 per cent of the adult population was illiterate on the eve of the Second World War. The percentage was even higher among national minorities (the Ukrainians, Belarussians and Lithuanians), who composed one-third of the population in pre-war Poland. Contradictions between the ruling national and ethnic minorities, which found its expression in culture, were also characteristic of other Central-European and Balkan countries: Czechoslovakia, Yugoslavia, Romania and, to an extent, Bulgaria. Unlike Poland, which turned into a multi-national state during the inter-war period, in the above-mentioned countries this contradiction did not disappear after the Second World War. At the same time one should underline that ethnic minorities in those countries were not only a source of tension, but also helped to establish contacts between national cultures insofar as the minorities played the role of mediator.

## CULTURE IN THE POST-WAR PERIOD

The establishment of a new system of international relations in Europe had absolutely different consequences for Hungary than for Czechoslovakia and Poland. As one of the constituent parts of the Dual Monarchy, which not only was sovereign in all home affairs, but also influenced the foreign policy of the Danube Monarchy, Hungary was regarded as a loser in the First World War, an attitude that dominated the Versailles conference, when her post-war borders were being defined. The new boundaries excluded about one-third of the Hungarians, and Hungary, which had previously played a leading role in Central Europe, was now reduced to a smaller state, flanked by bigger neighbours. The process of adaptation to a new geo-political situation, which was extremely painful, dominated spiritual life in inter-war Hungary.

The Hungarian ruling elite tried to compensate for its loss of a leading role in the Danube-Carpathian region by

turning into the main cultural centre of East-Central Europe. The cultural programme of the Horthy regime attempted to create a powerful infrastructure for elitist culture, the building of new universities, high schools, academic institutions, museums and libraries. Flanked by the hostile 'Little Entente' countries, Hungary oriented her foreign policy towards Mussolini's Italy and later, in the 1930s, towards Nazi Germany, which was also deeply dissatisfied with the Versailles system.

After the unsuccessful socialist experiment in 1919 many renowned intellectuals of progressive convictions had to emigrate from Hungary. Among them were György Lukács, the young sociologist Karl Mannheim, a founder of film aesthetics, Béla Balázs, the leader of the Hungarian avant-garde and a founder of film aesthetics, the poet and artist Lajos Kassák, painters and graphic artists Béla Uitz, László Moholy-Nagy and Sándor Bortnyik and many others. Some of them later returned, some never. Despite this emigration of many celebrated Hungarian intellectuals, cultural life in the country was still very intense.

Béla Bartók is by right regarded one of the greatest composers of the twentieth century. He successfully mixed folklore elements with the achievements of Schönberg's new Viennese school. The name of Zoltan Kodály – a composer, a folklorist, a teacher of music – is widely known. Operettas composed by Imre Kálmán and Ferenc Lehár, who worked mainly in Vienna, are popular all over the world. Since the 1930s Hungarian conductors Antal Doráti, George Szell, Sir Georg Solti and others had been conducting the best symphony orchestras of the world. The Hungarian school of pianists and violinists had a very high reputation. Hungarian actors, such as Béla Lugosi or Franziska Gaál, were in demand by the best film studios, including Hollywood. The plays of Ferenc Molnár were performed in many countries.

The vigorous development of Hungarian literature and national culture decreased on the eve of the First World War. The key figure of the first decades of the twentieth century was the poet Endre Ady, who died in 1919. Zsigmond Móriz, Mihály Babics, Dezső Kosztolányi, Gyula Krúdi, Frigyes Karinthy and Árpád Toth, who belonged to the same generation, also participated actively in the literary life of the inter-war period. In the 1920s a new generation came along: the poet Attila József, prose writers Tibor Déri and Sándor Marai, as well as members of the movement of 'national writers' that included the master of the psychological novel László Németh, the poet and prose writer Gyula Illyés and the prose writer Aron Tamási.

The Hungarian fine arts in the period 1900–1930 reflected the same process under way in other countries, namely, a transition from traditional academic salon historicism to the newest trends (from impressionism to surrealism and abstractionism). One should mention the key figure of the Hungarian secession József Rippl-Rónai, the expressionist Károly Kernstock, the fauvist Béla Czóbel and the master painter József Egry. The works of Tivadar Csontváry are characterized by deep originality. In the 1920s some new names appeared: the expressionist Gyula Derkovits, the post-impressionist Aurél Bernáth, and the great monumentalist painter Vilmos Aba-Novák. In the late 1930s the Szentendre School of surrealism was organized by Lajos Vajda and Imre Ámos. There were many talented sculptors at that time who, while respecting academic neo-classical traditions, also searched after new forms of artistic expression (Ferenc Medgyessy, Zsigmond Kisfaludi-Stróbl, Pál Pátzay, Béni Ferenczy and others). Victor Vasarely (Vásárhelyi) the founder of 'optical art', also called op art, became famous working abroad in France. In architecture besides neo-baroque and neo-classicism there were also new trends, such as constructivism and functionalism, represented by Marcel (Lajos) Breuer, who later emigrated to the United States, and others.

Being a small and moderately developed country, Hungary could not spend large amounts of money on expensive scientific investigations, and many leading specialists emigrated. The contribution of Hungarian-born scientists to twentieth-century science is invaluable. Let us mention only a few names, such as the mathematician and cybernetist János Neumann, the 'father' of the American hydrogen bomb Edward Teller, his colleagues nuclear physicists Eugene (Jenő Pál) Wigner and Leó Szilárd, the experimental physicist György Békésy, the founder of holography Dénes Gábor, the aerodynamics expert Theodor Kármán, the chemist Richárd Zsigmondy, biochemist Albert Szent-Györgyi, radiochemist György József Hevesy and the astrophysicist Zoltán Bay. More than ten Nobel Prize winners in sciences were of Hungarian origin. But only Szent-Györgyi had won the prize (in 1937) before he emigrated to the West.

The Miklós Horthy regime was right-wing, authoritarian and non-democratic, and its cultural policy failed to achieve basic changes in drawing the popular masses into elitist culture. That is one reason why the regime was widely criticized by people from opposing philosophical camps, for instance by the 'national writers'. But the problem of providing cultural infrastructure and education at all levels was even more acute in the Balkan countries. The abolition of mass illiteracy was mostly achieved only in the lands that had been integral parts of Austria-Hungary, namely in Croatia and Slovenia (Yugoslavia), and in Transylvania (Romania). The Balkan countries did make progress during the inter-war period; nevertheless, in the 1940s, illiteracy was still a major problem. In the 1920s and 1930s the Balkan countries were more successful in developing sciences and higher education. As usually happens in industrially underdeveloped countries, Balkan universities allowed arts and letters to dominate the natural sciences. At the same time national schools of natural sciences had also been created by the 1940s. A number of scientists and scholars, namely the Serbian geographer Jovan Cvijić, the Romanian microbiologist Victor Babeş, the Serbian linguist Aleksandr Belić, and the Bulgarian medievalist V. Zlatarsky, were members of learned societies. Bulgarian and Bulgarian-born scholars contributed to archaeology and Byzantine studies, and later to various branches of linguistics. A strong school of medievalists was created in Croatia.

Inter-war culture in the Balkan countries is associated with a cohort of world-famous artists, such as the Croat writer Miroslav Krleža, his compatriot Ivan Meštrovic, whose sculpture is full of heroic passion and nationalistic themes, and the Romanian composer and violinist George Enescu. The Serbian prose writer Ivo Andrić, a master of historical novels, was awarded the Nobel Prize in 1961. One of the founders of European abstractionism was the Romanian-born sculptor Constantin Brancusi (Brânkuşi). Although he lived and worked in France, he never broke off relations with his homeland. Two other famous figures of French cultural life – the 'theatre of the absurd' dramatist

Eugene Ionesco (Ionescu), and the patriarch of surrealistic literature Tristan Tzara – were both born in Romania. The Croat Anton Augustinčić and Romanians Dimitre Paciurea, Ion Irimescu and Cornel Medrea were celebrated sculptors. The Bulgarian composer Pancho Vladigerov became popular working in Berlin in the 1920s in cooperation with the great theatre director Max Reinhardt. The outstanding Croat director Branko Gavella directed performances not only in Yugoslavia, but also abroad, in Milan, on the stage of 'La Scala'. The great Serbian comedy-writer Bronislav Nušić was at the peak of his creative ability in the 1920s and 1930s.

In the first half of the twentieth century painting in Slovenia was in its heyday. Yugoslav, especially Croatian, naive art by the group Zemlya, founded by K. Hegedušić, I. Generalić, F. Mraz and others became a significant phenomenon in world culture. Though a certain backwardness of construction engineering hindered the realization of bold architectural projects in the Balkans, in Slovenia Jože Plečnik Meštrovic founded a strong national school in architecture. There were also talented architects in Croatia, for example Viktor Kovačić. In Romania and later in Bulgaria famous vocal schools were created. After the Second World War the Bulgarian singers Boris Khristov, Nikola Gyaurov, Nikola Gyuzelev and others were singing in the world's best opera companies. A number of celebrated violinists, pianists and conductors came from Romania. One of the characteristic features of Yugoslav composers was their quest for stylistic variety. In Bulgaria and Yugoslavia many choirs were flourishing.

Social criticism was characteristic of Romanian literature (Mihail Sadoveanu), painting and graphic art (Corneliu Baba and others). The works of Romanian poets Tudor Arghezi, Lucian Blaga and Octavian Goga, Bulgarian writers Yelin-Pelin, Yordan Yovkov and Anton Srtashimirov, the Serbian poet Desanka Maksimović, the prose writer and poet Miloš Crnjanski, and the Croatian poet Tin Ujević formed the core of national literatures. The Bulgarian fine arts are famous thanks to such painters as Vladimir Dimitrov-Maistora and Dechko Uzunov and the sculptor Ivan Lazarov.

The gap between high culture and mass culture, which strongly influenced relations between artists, their language and the way they saw their mission, was not so pronounced in the Balkans as in Central Europe. The notion that artists have a mission to enlighten and 'awaken' was still deeply rooted. By the same token, in the first half of the twentieth century the ideas of 'pure art' and the autonomy of creative activity were becoming established in the region.

The Second World War caused significant damage to the national cultural institutions of East-Central Europe. A number of museums, libraries, educational institutions and theatres in Warsaw, Budapest and other cultural centres were destroyed. Many celebrated writers, artists, scientists and scholars became victims of the Nazi terror. Some of them had to emigrate. Others joined the anti-fascist movement in their home countries. Some universities in Poland went on working underground. The motif of anti-fascist resistance dominated East-Central European cultures in the late 1930s and early 1940s. Let us mention a characteristic monument of that age, 'The Report with the Loop Around the Neck,' by Julius Fučílc.

The opportunity for a radical democratic change after the victory over fascism was not realized. By the late 1940s in the majority of East-Central European and Balkan countries, communist regimes of the Stalinist type were established. The Soviet military presence and political pressure of the USSR were decisive. But in some countries the period of one-party dictatorship was preceded by a short (two- or three-year) period of anti-fascist coalition, characterized not only by political struggle, but also by a certain political pluralism. One of the main motifs was the rethinking of recent history. The emotional experience of people who had undergone unprecedented upheavals found expression in the Polish psychological novels of the late 1940s (Tadeusz Borowski, Jerzyi Andrzejewski, Stanislaw Dygat, Tadeusz Breza and others), which were deeply influenced by existentialist philosophy. Later, in the 1950s and 1960s this motif was further developed in Polish cinema, as well as in Hungary, Yugoslavia and other countries of East-Central Europe. This theme became dominant in other branches of culture also: the Serbian 'partisan' literature of Branko Čopić, Oskar Davičo and others deserves special mention. Yugoslav, Czechoslovak and Polish artists created brilliant monumental masterpieces in painting and sculpture.

The communist regimes' total ideological control in Eastern Europe had deeply affected the relations between the politically powerful and the artistic intelligentsia. There followed attempts to turn artists into instruments of propaganda and ideological attacks on the population. The dominant concept of socialist realism was obligatory, its postulates prescribed artists a limited number of canons, defining both the content and form of their creations. Most East-Central European countries reduced their cultural contacts with the West. Variety was replaced by forced uniformity and 'masterpieces' of Soviet culture made in accordance with the model of social realism. Even those masters who accepted the idea of social reorganization along socialist lines, tended to submit their activity to the needs of party propaganda. The gradually deepening conflict between artists and the authorities found its ultimate expression in the Polish and, especially, Hungarian revolts of 1956. Later, when other attempts to democratize the system (Czechoslovakia, 1968; Poland, 1968, 1970, 1976, 1980–81) were undertaken, the intellectual elite, including artists, were invariably in the epicentre of events, acting as an alternative political force and exposing themselves to the repressive machine (let us mention persecutions of intellectuals in Poland in 1968, or in Czechoslovakia in 1969–70). Generally speaking, opposition and 'dissident' movements in East-Central European countries were of an intellectual nature, their social base only widening during the height of the crisis, as in Hungary and partly in Poland in 1956, or in Poland in the early 1980s, when the intelligentsia and the working masses demonstrated brilliant unity in their battle against party-bureaucratic socialism.

By the late 1950s and early 1960s as a result of internal political changes in the Soviet Union, the repressive mechanism in most East-Central European countries was slightly relaxed. This inevitably influenced the state of cultural affairs. Thus, sciences and especially social sciences were relatively de-ideologized, while in arts the previous hard line of social realism was replaced with a new concept, more flexible, allowing in some countries a certain variety of formal and stylistic tendencies and leaving some limited space for critical depiction of negative sides of reality. A noteworthy example was Stalin's reign of terror, which drew the attention of many writers of that period.

In Hungary, where the János Kádár regime had learnt a lesson from the events of 1956, the country was looking for a more effective model of socialism, and thus clearly demonstrated how the intelligentsia's resistance to totalitarianism could force the authorities to make concessions, and sometimes quite significant ones in matters of cultural policy. From the 1960s on, the moderate character of Kádár's political regime also created a more liberal cultural policy. The authorities interfered in cultural life only when alternative views seemed to threaten directly the official Marxist ideology. For example, in the early 1970s Kádár found danger in the Lukács school philosophers (A. Heller and others) who reflected on the possibility of a synthesis between democracy and socialism.

Nevertheless, despite undeniable limitations in the sphere of politics and ideology, the Kádár epoch made a remarkable contribution in the development of national culture. The most significant success is associated with the cinema. The works of Miklós Jancsó and István Szabó earned world fame. Films of Zoltán Fábri, Zoltán Huszárik, András Kovács, Marta Mészáros, Károly Makk, István Gaál, Pal Sándor won numerous prizes at international film festivals. The composer György Kurtág, as well as György Ligeti, who lives in Germany, are among the luminaries of modern European music. The achievements of Hungarian choreography in the 1980s and 1990s are associated first of all with the Győr ballet company, headed by the pupil of Maurice Béjart, Ivan Markó, who, together with the Pole Kazimierz Dziewecki are the most interesting figures in modern East-Central European ballet.

In the plastic arts Hungarian sculptors proved to be the most prominent. Jenő Kerényi, Tibor Vilt, B. Megyeri, István Kiss, Imre Varga, E. Saár and others earned world-wide fame. The genre offers great variety ranging from smaller forms to genre compositions with theatrical elements. One of the most well-known artists of the 1960s was Béla Kondor and his pencil drawings. One should also note the achievements of Hungarian artists in monumental painting, tapestry and ceramics (Margit Kovács). The architect Imre Makovec, whose style is a symbiosis of romantic elements with modern construction engineering, merits universal acknowledgement.

In the post-war period there appeared such prominent figures of Hungarian literature as poets Janos Pilinszki and Sándor Weöres, the novelist and playwright I. Erkeny and others. Renowned poets Ferenc Juhász, László Nagy and Sandor Csoóri belong to the 1950s generation. The 1970s also produced many talented writers, for instance Péter Esterházy and György Spiró. And finally we should mention Imre Kertesz, who won the Nobel Prize for literature in 2002.

Hungarian science is associated with discoveries in theoretical physics, optics, organic chemistry, biochemistry, psychology and microbiology. Compared to other East-Central European countries, Hungarian scholars, especially economists and sociologists, enjoyed more favourable working conditions between the 1960s and 1980s. Thus, János Kornai's works on the theory of economic transition were widely published and supported all over the world.

In Czechoslovakia there was significant progress in those sciences that were traditionally highly developed in that country. For example, the chemist Jaroslav Heyrovský was awarded the Nobel Prize in 1959 for his work on polarography. Scientific reform started in the early 1950s, and improved to some extent the institutional, material and technical basis of science in Czechoslovakia and neighbouring countries. On the other hand it resulted in decreasing the scientific potential of universities by causing a gap between science and higher education. The humanities and social sciences suffered especially. After the events of February 1948, when the Czech Communist Party came to power, many people in these fields were deprived of work. In the mid-1960s, together with some political liberalization, some animation was observed in almost all social sciences. After changes in August 1968 many renowned scholars were again removed from their positions, or had to emigrate. Unlike Czechoslovakia, the communist regime in Poland never fully deprived universities of their autonomy. Thus, some prominent representatives of neo-Thomistic and neo-positivist philosophy were able to keep their chairs. Between 1957 and 1962 the Academy of Sciences was headed by Tadeusz Kotarbiński. Since the late 1960s social support for the communist regime in Poland had been running out. The persecutions of ideological opponents resulted in the emigration of philosopher Leszek Kolakowski and other celebrated representatives of the Polish intelligentsia. By the 1980s the influence of Marxism had dwindled to almost nothing. The main opponent of Marxism was Catholic ideology, backed by the Church (kościól) and still very influential.

The same success marked artistic culture during this period. The mid-1950s 'thaw' gave birth to the new school in the Polish cinema. Its heyday in the late 1950s and early 1960s was associated with the films of Andrzej Wajda, Andrzej Munk, Jerzy Kawalerowicz, Aleksander Ford, Jerzy Passendorfer, Jerzy Hoffman and others. By the 1980s, Wajda had become one of the most celebrated film directors in the world. That was about the same time that Krzysztof Zanussi was beginning his career, and Roman Polański, who had emigrated to the United States, was a top director in Hollywood. In the late 1980s one more star appeared – Krzysztof Kieślowski.

Among noteworthy theatre directors of the last few decades are Konrad Swinarski, Kazimierz Dejmek, Ervin Axer and Adam Hanuszkiewicz. One leader of the avant-garde, Jerzy Grotowski, is well known beyond the Polish border. Tadeusz Kantor and Józef Szajna, a brilliant avant-garde director and painter, are well known throughout the world.

Many great composers came to prominence in the 1960s: Witold Lutoslawski, Krzysztof Penderecki, Tomasz Berd, Kazimierz Serocki and Jan Krenc, who is also famous as a conductor.

In the mid-1950s Polish literature was characterized by a variety of styles and produced a number of talented writers. Stanisław Lem became famous for his science fiction. Sławomir Mrożek is well known beyond Poland's borders as a playwright who represents a peculiar branch of the 'theatre of the absurd'. The deeper the crisis of socialism, the greater the role played by the *samizdat* underground press in Poland. It is noteworthy that many of the underground writers were in touch with Polish emigrants, who served as mediators with Western intellectuals.

From the end of the 1950s, Poland's art community was characterized by a variety of movements. The works of pencil artist Tadeusz Kulisiewicz, sculptor Wladyslaw Hasior, the avant-garde painter Jerzy Duda-Gracz and others enriched Polish national culture. Poster graphics became an art form in Poland, as it did in Hungary in 1919.

Polish architects won numerous prizes in international competitions. During the Second World War 80 per cent of Warsaw was completely destroyed, and many other towns also suffered severely. The urgent task of reconstruction – and the limited funds available – stimulated rational tendencies in architecture. Poland, as other East-Central European countries, fell under the influence of contemporary Soviet samples – stylistically eclectic, pompous, excessively decorated buildings – but already in the mid-1950s Polish architecture was shifting towards rationality and simplicity.

As to the sciences, Polish scientists made discoveries in theoretical physics (Leopold Infeld), electronics (Janusz Groszkowski), higher mathematics, medicine and agriculture. The heyday of post-war Czechoslovak culture occurred in the 1960s, when society in general and the intelligentsia in particular believed in the idea of 'socialism with a human face'. The theatre scene was very dynamic: directors Otmar Krejča and Alfred Radok, and the Czech school of set design (Josef Svoboda and others) won renown in the world. The Czech cinema – not only in feature films, but also in animated cartoons – searched after genre and stylistic variety. The Czech school of animated cartoons (Jiří Trnka and Karel Zeman), which developed from the rich traditions of national puppet-shows (J. Skula) is one of the best in the world. After August 1968 many prominent artists had to emigrate (film director Miloš Forman among them), others, like the playwright Václav Havel or the film director Věra Chytilová found obstacles were put in their way. Nevertheless, the development of modern communications and the widening of direct contacts, especially after Helsinki (1975), brought to nought all the authorities' efforts to block channels of communication with the West. There was no spiritual isolation despite the 'iron curtain', and in the 1970s and 1980s Western intellectual tendencies found immediate response in Czechoslovakia, Poland and Hungary due to the *samizdat* too. So, the involving of these countries in the processes of European cultural integration had begun much earlier than the day in 1989 when the Berlin Wall came down.

The Balkan countries, which had concentrated on reducing illiteracy and building schools, were doing well in improving the citizens' cultural level and providing educational opportunities and mass communication for the general population. Specialized institutions for advance studies in natural sciences and humanities were making progress.

Marshall Tito's decision in 1948 for Yugoslavia to break with the Soviet Union necessarily influenced how Yugoslav culture developed. Artists were not always obliged to follow the Party line and political and cultural isolation from the West were gradually overcome. Owing to this, pluralistic tendencies in Yugoslavia manifested themselves earlier than in other socialist countries. From the early 1950s surrealist, abstractionist and, later, post-modern tendencies were each represented in Yugoslav painting. Avant-garde tendencies showed themselves in music, the theatre and cinema. Literature fell under the strong influence of existentialist philosophy. The Zagreb school of animated cartoons, the architect Bogdan Bogdanović's works, Yugoslav monumental sculpture, novels and films devoted to the national-liberation movement during the Second World War – all these contradictory tendencies were part of Yugoslav culture. However, liberalism in cultural policy was relative, and there was still persecution of the activist Milovan Djilas for

his book *The New Class*, as well as prosecution of *Praksis* magazine, edited in Zagreb by a group of philosophers who were adherents of non-orthodox Marxism.

One of the most striking features of the Romanian model of socialism under Ceauşescu was its openly nationalist character. The unapologetic focus on national traditions, with its explicit negation of the Soviet experience, could not help but remove numerous typological similarities with the communist systems in other countries. This found its expression in cultural policy, which became increasingly intolerant and oppressive. The theory of protochronism was a kind of aggressive superiority complex claiming that all more or less significant trends in world culture came from Romania. The recognition accorded Constantin Brancusi, Eugene Ionesco and Tristan Tzara encouraged the Ceauşescu regime to attempt to submit artists to the task of glorifying the ruling clan. Nevertheless, Romanian culture produced a number of true masterpieces in the last few decades. There were incontestable achievements in theatre (the famous theatre and film director Liviu Coulei, the actor Radu Beligan, and especially one of the greatest figures in the modern European theatre, Andrei Şerban), animation (the director Ion Popescu-Gopo), musical performance, sculpture and literature (Marin Sorescu, Dumitru Radu Popescu and others). Romanian and Bulgarian architects won worldwide accolades for their health resort projects on the Black Sea.

In Bulgaria, liberal tendencies in cultural policy began showing themselves in the 1970s and were mainly associated with Lyudmila Zhivkova's activity as the Minister of Culture. In the 1980s, as the popular masses' confidence in the ruling elite was shaken, the latter more and more relied on national traditions. Painters were encouraged to turn to national history, especially Bulgaria's medieval period. The prose of Jordan Radichkov, Yemiliyan Stanev and Pavel Vezhinov, poetry of Elisaveta Bagryana and Valeri Petrov, canvases of Zlatyu Boyadzhiev and others belong in the highest ranks of Bulgarian fine arts in the 1960s to 1980s. Bulgarian documentary films won many prizes at international festivals. The theatre, opera and ballet were of a consistently high level, with traditional chorale singing carefully preserved and Bulgarian opera singers internationally acclaimed.

Albania made significant progress in overcoming mass illiteracy and building up its cultural infrastructure, but the political isolation set in motion in the late 1950s quickly cut off cultural links with the outer world and exerted a negative influence on national culture. It was during the inter-war period that the generation of educated creative artists was brought up in Albania.

Unlike other Balkan countries, Greece had escaped socialist experiments and made good progress in the last two decades. This ancient country, already a cradle of European civilization, has gone on in the twentieth century to make more valuable contributions, including those of the singer Maria Callas, the Nobel Prize-winning poets George Seferis and Odysseus Elitis, the poet Janos Ritsos, novelist Nikos Kazandzakis, sculptor Georgeadis, composer Mikos Teodorakis, film directors Teos Angelopoulos and Michael Cakoyannis, actresses Melina Mercuri, Irena Papas and others. Many of them became famous working abroad.

The formation of independent intellectual communities playing an important role in the ideological preparation of 1989 was accelerated by Mikhail Gorbachev's *perestroika*.

It is too early to evaluate how the great political and economic changes of 1989 influenced the cultural activities and perception of culture in Central and Eastern Europe. One can give only some preliminary notes. On the one hand, widening of democratic freedoms contributed to increasing the diversity of conceptual and stylistic creation. Moreover, one can evaluate positively the importance of opening borders, allowing youth to study abroad, opening access to information, and developing exchange and cooperation among universities and European cultural programmes. European integration is embracing East-Central Europe more and more closely. On the other hand, the role of the state as a sponsor of culture has diminished. It is noteworthy, for instance, that in the early 1990s the annual production of full-length films greatly declined in most East-Central European countries. Sometimes, commercialization lowers the quality of a 'masterpiece', but at the same time following the standards of contemporary Western 'mass culture' East-Central European artists lose out in the competition for expanded markets.

## THE POST-1989 SITUATION

The post-1989 changes had other consequences for culture too. First of all, the communist system had always fulfilled not only the role of ideological guard and censor, but also that of patron, providing both material protection and spiritual inspiration. Some creators even came to view the authorities as the chief audience for their works, more important even than the public. The reduced role of the state as a sponsor of culture also affected the status of many artists. As a result of these changes, the social function of the artist has also changed. Earlier, given the lack of democratic institutions, it was often the artists who played the role of 'spiritual opposition'. With the development of more democratic systems this role was no longer necessary. Today, artists can devote themselves entirely to creative activities and leave politics to the professional politicians. But in this case they must give up their former status as the nation's spiritual leaders.

Both East-Central, and South-Eastern Europe are characterized by close interaction of different cultures, and depending on historical circumstances they alternate between mutual attraction and repulsion. Processes of national disintegration in modern East-Central Europe have taken different forms (Maps 11 and 12). It is hardly possible to compare the break-up of Czechoslovakia with that of Yugoslavia, although both testify to the growth of 'centrifugal' tendencies closely linked with different manifestations of nationalism. But another tendency has also manifested itself – a desire for spiritual integration. It is worth noting that the intelligentsia of the successor-states have sometimes turned to Austria-Hungary for their spiritual models: Kafka's fiction, Rilke's philosophical lyrics, Freud's psychoanalysis and Wittgenstein's analytic philosophy, the new musical language of Schönberg and the Viennese school, and Bartók's musical compositions that incorporate folklore. Other innovative models include the unique mixture of satire and fantasy in Čapek's novels, the inimitable architecture and applied art of the Viennese secession, Masaryk with his desire to combine democracy and socialism on a solid ethical base, and Lukács with his desperate and vain attempt to reanimate classical Marxism using the strength of his

outstanding intellect: these are the bricks upon which the intelligentsia of the region have built their contributions to both national culture in their own country, and world culture.

*Map 11* **Eastern Europe, 1945–1990**



Adapted from R. and B. Crampton, 1996, *Atlas of Eastern Europe in the 20th Century*, Routledge, London.

*Map 12* **Eastern Europe, early 1994**



Adapted from R. and B. Crampton, 1996, *Atlas of Eastern Europe in the 20th Century*, Routledge, London.

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# 32

## NORTH AMERICA

### *Claude Fohlen*

Was the twentieth century the American century, as is commonly said? A close look at the century just ended suggests that there is no denying the continuous and rising influence of the North American continent, which went hand in hand with the shift of the world's centre of gravity from old Europe to the New World. Of course, the appearance of the United States on the world stage, which goes back to the Spanish-American War of 1898, was confirmed by its mediating role between Russia and Japan in 1905. Its participation in the Great War – the first time Americans came to fight on European soil – opened a new era in history because American intervention saved democracy in Europe. In a prophetic article written in 1905, the French historian Henri Hauser said: 'In the last ten years, the tiny democracy formed by Washington has become one of the four or five main factors in world politics ... None of the powers of old Europe, not France, nor England nor Russia nor Germany can fail to be uninterested in this new situation'. And he concluded: 'Henceforth, government of the globe will no longer be a matter for Europe alone'. In fact, Europe had already lost it, since the Americans, on the strength of their military intervention and Wilson's advocacy of 'peace without victory', which was later codified in his Fourteen Points, had imposed themselves as essential arbiters in negotiating the armistice of 11 November 1918 that concluded the war in Europe and then rejecting the Treaty of Versailles.

That intervention heralded the growing influence of the United States in international affairs. While after the war it gave the impression of withdrawing from the international stage, although in reality it never actually did so, its role in the Second World War established its position as one of the two superpowers. It was thanks to the action of the United States that Europe was able to recover and rebuild itself materially. Its presence was felt in every hot spot around the world, where it clashed with the other great power that had also emerged victorious from the war, the USSR (Union of Soviet Social Republics). The conflict between the 'big two' dominated the second half of the twentieth century, in a quite novel form of confrontation, the Cold War, which ended in 1989 with the collapse of the Soviet empire and a totally new situation, a unipolar order.

In only two centuries of existence, 'the tiny American democracy' had become the foremost power in the world.

American preponderance was ensured not only by the country's economic and military power, but also by its institutions, the democratic liberal ideal successively proclaimed by Wilson and Roosevelt, which they tried to export to the world, claiming to follow in the footsteps of the founding fathers, George Washington, Thomas Jefferson and Abraham Lincoln. Americans became the celebrants of a form of government that they believed would bring happiness to all humanity, but it was also through their material culture that American influence came to dominate. The French had put their seal on the eighteenth century, and the British on the nineteenth, but now it was the turn of the Americans to do so for the twentieth century. The 'American way of life' took root on every continent, spreading a language which claimed to be of English origin yet was not English; and spreading a way of living, eating, dressing and spending one's leisure time that bore the strong imprint of its origins and was validated by a neologism, the word *Americanization*. Watching American films changed the behaviour of millions of individuals all over the world, making America at once a whipping boy and a model, a situation that the fall of the Soviet empire reinforced, although it was called into question by the al-Qaeda terrorist attacks of 11 September 2001.

The history of Canada in the twentieth century is inseparable from that of its big southern neighbour. This British dominion moved further and further away from its former allegiance to become an integral part of the North American continent. In 1914, it let itself be drawn along in the wake of the mother-country and entered the struggle against the central empires, but in 1939 it struck out alone, making its own declaration of war a week after Britain did and not hesitating subsequently to place itself deliberately in the American orbit. After the conflict was over, the Canadians established their own citizenship, and adopted the maple leaf as their own flag in place of the Union Jack. In 1994, the symbiosis with the United States was sealed by the free trade treaty (NAFTA) designed to integrate the continental economy. But while, economically, Canada became the rear base partner of the United States (with

87 per cent of its exports going to the US), it was able to preserve its political identity: it remains a member of the British Commonwealth, combining a typically British regime – parliamentary institutions, ministerial responsibility, elections called as needed – with a variant of federalism, all crowned by official bilingualism in French and English. While becoming ever more closely integrated into the continent, Canada was nevertheless able successfully to maintain and develop its own personality, even in the shadow of its neighbour, and sometimes in opposition to it internationally. Its humanitarian and peaceful interventions, which earned its minister of external affairs, Lester Pearson, the Nobel Prize for peace in 1957, made it an active and respected member of the international community.

## IMMIGRATION, SETTLEMENT, POPULATION

Over the century, the territorial configuration of the North American continent hardly altered. In 1949, the British colony of Newfoundland decided to join the Canadian Confederation and become its tenth province. Then after lengthy negotiations, it was finally agreed in 1992 to transfer an area in the Northwest Territories called Nunavut ('Our Land') to the Inuit and other native peoples living in the territories. As for the Americans, in 1959 they extended their borders outside the continent by admitting two new states, Hawaii and Alaska, thereby bringing the number of states to fifty, while also maintaining a hybrid 'commonwealth' status for Puerto Rico.

But what did change dramatically were settlement and population. While Europe grew older as it suffered the full impact of the two world conflicts, the North American continent experienced unprecedented population growth.

A few figures indicate this shift. At the beginning of the twentieth century, the United States had a population of 76 million, and Canada, 5.3 million; by the end of the century, these figures were 285 million and 32 million. Broadly, the population of the United States had grown by a factor of four, and that of Canada by a factor of six. Such examples, very rare not to say unique among the developed countries, merit some discussion.

North America retained and even enhanced its power to attract new people, refuting fears expressed in some quarters at the end of the nineteenth century over the closing of the frontier. The American dream continued to fuel immigration, although its character changed in both countries.

Contrary to earlier patterns, immigration shifted from northern Europe, Britain, Germany and Scandinavia towards southern and eastern Europe. The largest immigrant flows, which poured in during the first two decades of the century, were essentially composed of Italians (including Sicilians), Poles, Russians, Ukrainians, Romanians and Jews from across Europe. There had never been so much immigration as in those years, with numbers rising to over a million for the first time in 1905 and reaching a peak in 1907 and 1914, with 1.2 million. There was talk then of a 'new immigration', since these newcomers were markedly different from those who had come before them in terms of their origins, illiteracy and poverty, and the difficulty of integrating them into their host country.

The integration of these new immigrants into a foreign environment created difficulties that called forth two different responses. Some put their faith in the melting pot, the concept popularized in 1919 by Israel Zangwill's highly successful play of the same name. It was really a slogan designed to persuade newcomers that they could become good Canadians or good Americans, by masking the diversity of the population under a single label. In fact, these newcomers clustered together in ethnic districts, with Oriental Jews on the Lower East Side of New York, Italians in Little Italy in Boston or the Italian district of Toronto, Puerto Ricans in the *barrios*, not to mention Chinese in two of the biggest Chinatowns on the continent, in San Francisco and Vancouver. Thus, within the population, marginalized ethnic groups crystallized whose presence worried the Anglo-Saxon majority of WASPs (White Anglo-Saxon Protestants), worked up by nationalist fervour and anxious to perpetuate the 'Caucasian' values that Social Darwinism was deemed reliably to transmit.

### Restrictions on immigration

The other response was one that sought to slow down and restrict this massive immigration of people seen as different. The idea went back to the nineteenth century, when the massive arrival of Irish people had provoked a rejection that was often marked by violent clashes. On 18 February 1907, Congress approved amending existing immigration legislation that allowed President Roosevelt to issue an executive order stopping the migration of Japanese labourers from Hawaii and Mexico. This was followed by the Gentlemen's Agreement of 1908 – an understanding with Japan that it would discourage emigration at its source. In 1921 Congress passed the Emergency Quota Act, which limited immigration and introduced a distinct ethnic bias towards northern Europeans to the US immigration system. One of the means dreamed up to halt the influx was a literacy test, although the idea met with vetoes by a succession of presidents, especially Woodrow Wilson. The trigger for change came with the Bolshevik Revolution and anarchist threats, which led to the deportation from the United States of several hundred suspects to Europe.

The United States began enforcing a restrictive policy, based on quotas, in 1921 and strengthened it in 1924. Not only was the total number of immigrants limited to 150,000 per year, but each nationality was assigned a quota, based on the 1890 census, taken at a time when Europeans from southern and eastern Europe had yet to arrive. Americans from the rest of the continent were not affected, nor were categories such as teachers, students or ministers of religion. Canada resorted to similar practices using different means. The effects were drastic: between 1911 and 1920, 5.7 million immigrants entered the United States, as against 4.1 million in the succeeding decade, and 530,000 in the 1930s. It was not until the 1970s that their number again rose above 4 million.

This policy remained virtually unchanged for almost half a century, despite the racial, political and ideological persecutions that shook the world. America, deep in crisis and sapped by unemployment, could not and would not open its doors even a fraction, except for a few famous scholars such as Einstein; economics easily won out over humanitarianism. Following the Second World War, although quotas were maintained, modifications opened a special quota for 'displaced persons' and orphans, allowing

the entry into the United States of tens of thousands of European victims. As circumstances required, measures of this sort were applied to other populations deemed to be under threat, including Cubans after Castro came to power (250,000 in the 1970s), or Viet Namese (325,000 in the 1980s). While not so formalized, Canada's immigration policy had also been restrictive – asserting its determination to prefer the British immigrant (over one-third of new arrivals in the first half of the century) and virtually excluding the Chinese. Yet it, too, began to open up new possibilities for non-British immigration, by defining categories that took into account not ethnic criteria but humanitarian and professional ones instead.

## The new approach to immigration

Thus, from the 1960s, both countries saw a radical shift, with the massive arrival of new applicants for admission. Not only were national quotas abandoned in favour of overall quotas for each continent, but Canada opened the way by promoting family reunification and professional skills, with a system of points for assessing the need to attract specialists in specific fields. The results were soon apparent, both quantitatively and qualitatively.

This flood of new immigration surpassed the influx of the early years of the century. The United States admitted 4.5 million immigrants in the 1970s, 7.3 million in the following decade, and 9 million in the last decade: in total, there were 20 million immigrants in the first half of the century, as against 26.6 million in the second. Nothing could slow this flow, which reached an absolute peak of 1.8 million in 1991, or 7.2 per cent of the US total population. And these official figures under-estimate the scale of the movement, since there were also clandestine entries across porous borders. The American dream now exercised its fascination for the poor populations of the South. In Canada, the number of immigrants rose from 130,000 in 1981 to 230,000 ten years later, and in the 1980s 1.3 million of them entered, half in the category of family, in other words coming under family reunification. Despite a fall in the late 1990s, immigration continued to represent a substantial contribution to the North American population, which it helped to transform at the expense of its European roots.

This massive arrival of Asians and Hispanics profoundly altered the continent's ethnic makeup. In the United States in the 1960s, over 1.5 million Central and South Americans were recorded as entering, as against 1.2 million Europeans. But in 1991, only 7.5 per cent of newcomers originated from Europe, against 19.5 per cent from Asia, 51.5 per cent from Mexico, and 4.3 per cent from South America. The proportions were about the same ten years later: 132,000 Europeans, 265,000 Asians, 344,000 North Americans (including 173,000 Mexicans) and 56,000 South Americans. In Canada, there were more immigrants from Asia than from Europe, and there was a striking influx of residents of Hong Kong who settled in British Columbia. The United States saw the massive entry of Mexicans who used every possible means to enter the Eldorado of the North, despite electrified fences and the strengthening of ever-more pervasive surveillance. Trade unions might well complain of unfair competition from the clandestine labour of these illegal immigrants, but nothing could stop them. In

an attempt to put an end to it, President Reagan issued an amnesty that offered citizenship to all illegal aliens; however the experiment failed to clarify the situation and the waves of newcomers continued unabated.

The upshot was that Hispanics became the largest minority, numbering 36.9 million, replacing African Americans, who, hard on their heels, were relegated to second place. If present trends continue, it is clear that Hispanics will play a growing role in the life of the country and that their political clout will increase.

## Internal movements

Within the continent, North Americans continued and even accelerated their centuries-old movement from the East to the Southwest (Map 13). Despite the disappearance of the Far West frontier, its dynamic continues: at each decennial census, the United States' centre of gravity continues to shift in a western movement: at the beginning of the twentieth century, it was located in southeast Indiana; half a century later, it was in southern Illinois; by 1998, it was close to St. Louis (Missouri), and, in 2000, near the centre of that state. While such a construction is artificial, it does at least serve to highlight the shift of population, evidenced by the increasing power of the states along the Pacific Rim of the West Coast and along the Gulf of Mexico to the south.

The growth of three coastal states, Washington, Oregon and above all California, has been spectacular. California, whose current population of 34 million is expected to reach 50 million by 2010 (it was 23.6 million in 1980), is now the most populous state in the Union, easily overtaking the oldest states in the East; even New York State (19 million) has been relegated to third position, behind Texas (20.6 million). As a consequence, these peripheral states have gained considerable weight politically, electing the largest number of delegates to Congress in Washington, D.C. On top of this rather traditional shift westward, the period since the Second World War saw a marked move southward, explainable by the attraction of the sun (the Sun Belt), the abundance of resources, whether natural (oil, natural gas) or man-made (Tennessee valley dams), cheap labour due to the initial absence of unionization. These new localities were also favoured by the benefits of air-conditioning. Texas was the main beneficiary, while Florida (fourth-largest state in the Union, with 16 million inhabitants) owes its current prosperity to its beaches, its retirees and Cuban émigrés. By virtue of their demographic and economic importance, California, Texas and Florida became politically dominant in the last third of the twentieth century, providing virtually every president: Lyndon Johnson (Texas), Richard Nixon and Ronald Reagan (California), George H. W. Bush, and George W. Bush (Texas). Jimmy Carter and Bill Clinton can be added to this list, since both come from the Southern states of Georgia and Arkansas respectively. Internal migration benefited the West and the South at the expense of WASPs and the Atlantic coast establishment.

In Canada, where immigrants settled along a line following the border, there was a comparable movement westward, although on an altogether different scale. On the one hand, Toronto replaced Montreal as an economic powerhouse. And, on the other, the two Western provinces,

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*Map 13*  **Regional migration in North America, 1940–1960**
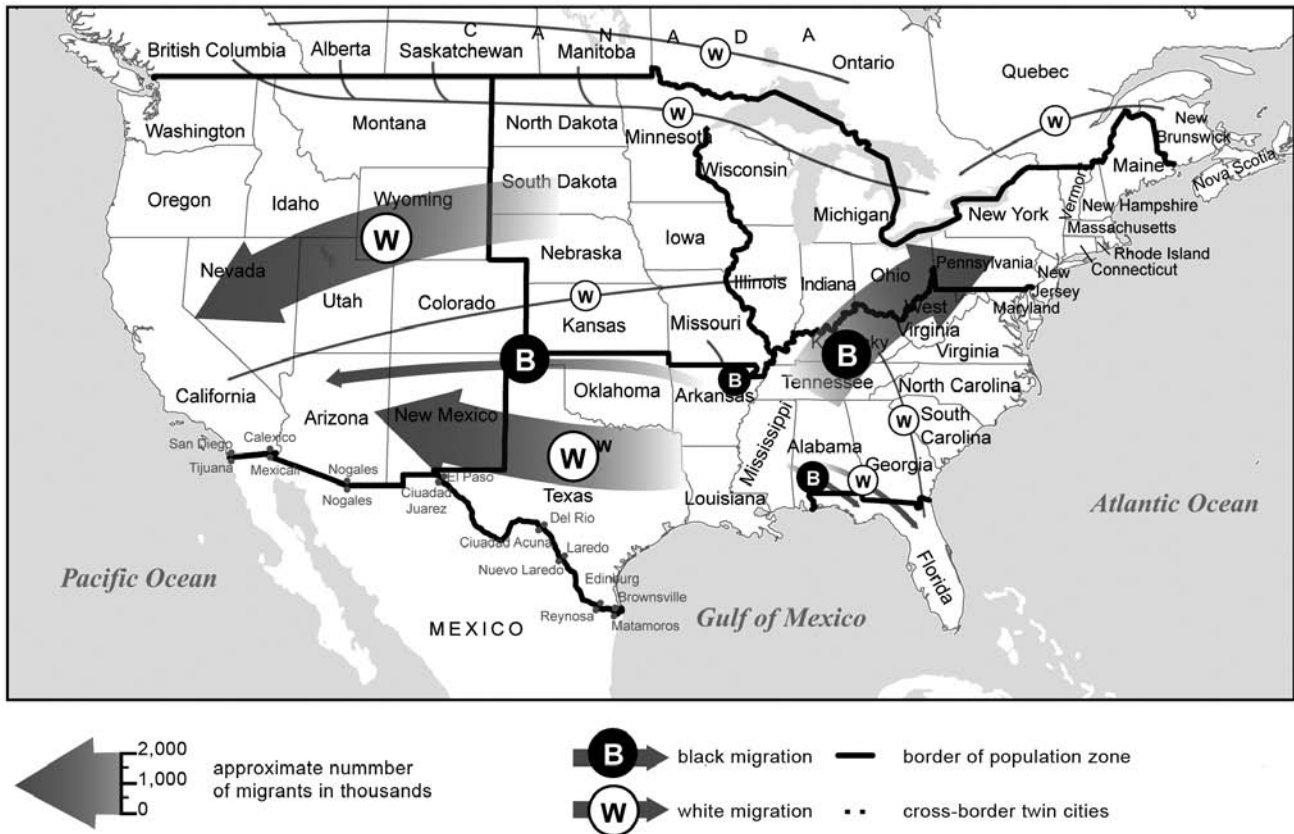


Adapted from R. Chaliand, 1998, *Atlas du millénaire: La mort des empires 1900–2015*, Hachette, Paris.

Alberta and British Columbia, played a growing role within the Confederation, making Vancouver the undisputed capital of the whole West. There too the political consequences revealed a rejection of the Eastern establishment since it was in the West that all the opposition parties appeared, from the Social Credit Party to Preston Manning's Reform Party, which was formed in 1987, in revolt against Ottawa's domination.

**Urbanization**

Another fundamental shift common to both countries was the phenomenon of urbanization or rather peri-urbanization. What had motivated immigrants up to the nineteenth century were possession of land and access to ownership. For Europeans still widely subject to an Old World regime, land was a major attraction; this pull has recently disappeared, however, leading to rural exodus and the concentration of population in cities or their suburbs. Whereas in Canada in the mid-nineteenth century, only 13 per cent of the population was living in cities, at present three out of four Canadians are settling in urban areas. This urbanization is unevenly distributed across the country, more highly developed in British Columbia, Alberta, Ontario and Quebec than in the Maritime Provinces and the Northwest Territories. These changes led to development of a new approach, in the shape of Census Metropolitan Areas (CMA), treating as a single region cities and their suburbs,

both in the big urban centres, such as Montreal, Ottawa, Toronto and Vancouver and in smaller urban areas, such as Oshawa, not far from Toronto.

This shift is also visible in the United States, where a new way of representing the population according to Standard Metropolitan Areas (SMA) was adopted to keep pace with these changes. SMAs group together both central cities with a population of over 50,000 and the outlying areas over which their activities extend. Currently, there are over 300 such metropolitan areas, embracing almost four-fifths of the total population and varying greatly in size, from the most populous – New York (20 million inhabitants), Los Angeles (15 million) or Chicago (8.5 million) – to the smaller ones in the Midwest or the Rockies. The creation of these metropolitan areas reflects a profound transformation of American demographics and especially the erosion of rural areas. In 1900, rural areas accounted for 67 per cent of the total population, as against fewer than 25 per cent by the end of the century. The attraction of urban centres acted as a magnet, both for newcomers and for Americans already living in the country.

At the same time, the nature of cities was changing. From being places of residence they became centres of tertiary activities. As means of transport developed, better-off households migrated to the residential suburbs (the green suburbs), and abandoned multi-occupancy buildings for individual houses with lawns, gardens and swimming pools. This resulted in the typical American landscape of sprawling suburbs, monotonous in the way they are built, but well

maintained and with plenty of vegetation. The phenomenon started right from the beginning of the century, with the arrival on the market of automobiles that were priced within reach of the pockets of the middle classes as a whole, and not simply those of the wealthiest few. The trend accelerated after the Second World War with the standardization of building techniques. The example was set by the Levittowns, named after William Levitt, the man who created them. In 1947, he launched his first experiment in New York State, where in just four years he built a community of 17,500 houses, designed to shelter 75,000 individuals. By using prefabricated materials that he produced himself at the rate of 30 units a day, a new form of habitat was launched, which won over the middle classes so successfully that Levitt repeated his experiment in several other states. The exodus to peri-urban areas accentuated the emptiness of city centres and downtown areas.

As their occupants left, these districts were taken over by newcomers, immigrants or ethnic minorities. This trend was already apparent at the end of the previous century, but in the twentieth it was accentuated by the attractiveness of these new residential suburbs. This led to a structure peculiar to North America, and more particularly the United States, of a rundown city centre gradually taken over by ghettos, contrasting with pleasant and prosperous suburbs. In reaction against this abandonment, but especially in the East and the industrial cities along the Great Lakes, an effort was made to rehabilitate the centre and to attract well-off residents back in; but, generally speaking, city centres have lost their attractiveness. There was thus a twin process of displacement, from the rural areas and from city centres to peri-urban areas. According to official figures, 50 per cent of Americans change their residence between censuses, in other words every ten years. Thus, the tradition of 'a population on the move' has continued unabated throughout the twentieth century, making Americans one of the most mobile populations among the industrialized nations of the world.

## FROM PROSPERITY TO DEPRESSION

The Americans, emerging victorious from a succession of conflicts, and in a position to impose their views on their allies, aimed to restore the conditions of normalcy as quickly as possible. This meant they often ignored the outside world that had temporally diverted their attention – continuing a line of conduct first drawn in 1799 by their founder, George Washington, and formalized again by President Monroe in the Monroe Doctrine of 1821. Two slogans highlighted this determination: 'return to normalcy' and 'business as usual'. In both, American hopes were cruelly disappointed: the aftermath of war proved to be more difficult than foreseen, with a short period of prosperity abruptly interrupted in 1929 by the longest and deepest depression ever experienced and one that was therefore all the harder to overcome.

Initially, the return to normalcy saw a series of disappointments. Two million 'boys' found themselves in Europe, wanting to get home fast. But the lack of ships meant that this return was slower than expected and was only completed in 1920. In the transit camps and military bases there were scenes of looting, acts of indiscipline and mutinies, which left a stain on the image of the American army in Europe.

Scarcely back home, these men found it hard to get jobs in a period of economic recession. Nothing had been planned for the changeover to a peacetime economy, and the situation was aggravated by the Spanish influenza epidemic and a wave of strikes in the iron and steel industry and the mines and shipyards along the Pacific coast. Jobs left vacant when the men enlisted in the army had been filled by women who were reluctant to give them up, especially as the Nineteenth Amendment now granted them the right to vote, marking their entry on the political stage.

Other causes for concern intruded into this already gloomy atmosphere. The Bolshevik Revolution awakened the 'Red Scare', 'Reds' being suspected of terrorist acts that culminated in the explosion of a bomb outside the Morgan Bank in New York, causing dozens of deaths. Whoever were responsible for it, it provoked a harsh repression, with the deportation to Russia of suspected anarchists, including Alexander Berkman and Emma Goldman, accused of the attempted murder of industrialist Henry Clay Frick, in 1892. The Americans, haunted by the fear of revolution, gave individual rights short shrift, as they would again following the Second World War.

On top of all these causes for concern, there were race riots, the most serious occurring in Chicago and resulting in hundreds of African American casualties. Some people saw in them the hand of the Ku Klux Klan, which had just arisen from the ashes – not in the South, as after the Civil War, but in Ohio. Its members paraded ostentatiously in Washington, at the foot of the Capitol, lumping Blacks, Jews and Catholics together in a common hatred. Defending nativism and sworn enemies of anything that might sully the purity of America, they made their mark on society, as McCarthyism did later during the 1950s. This bigotry came through in the hit films of D. W. Griffith, *Birth of a Nation* (1915) and *Intolerance* (1919). The aftermath of the war was indeed a period full of threats, which helps to explain the country's determination to restrict immigration and its apparent refusal to participate in international affairs.

### The great illusion

The outlook began to look brighter after 1920, as a period of jarring contrasts opened onto the 'roaring twenties'. After the worries and the sacrifices, came enjoyment, pleasure in the ordinary things of everyday life, a relaxation of social mores and a focus on getting rich. The Republicans came back to power, suggesting weariness with reform and a rejection of international engagements. Yet the decade abounded in contradictions, since it opened precisely on a return to morality with the Eighteenth Amendment (followed by the 1919 Volstead Act) forbidding 'the manufacture, sale, or transportation of intoxicating liquor within, the importation thereof into, or the exportation thereof from the United States'. So began the era of Prohibition, supposed to help deal with alcoholism, one of the ills plaguing society, by banning consumption of hard liquors such as whisky. This ban did not come out of the blue, but was part of a long struggle by temperance societies and Puritan denominations against an evil for which non-Anglo-Saxon immigrants were held responsible – the Irish, the Italians, the Slavs and others. This revenge of the Mayflower America against the America of the melting pot was not a mere chance occurrence.

While Prohibition was supposed to open the way for an era of morality, in practice it led to a decade of excess, debauchery and violence. Bars, restaurants, liquor stores and pubs ceased, at least officially, to serve beer, wine and alcohol, but a whole clandestine traffic sprang up underground, with *speakeasies*, where regulars would meet, and a contraband trade that enriched bootleggers. Private individuals began to produce adulterated alcohols, and, above all, a smuggling trade developed with Canada and the West Indies, while cruises to the Bahamas and other places where alcohol consumption was legal became very popular. The struggle for control of this traffic pitted rival gangs and gangsters against one another; they set up their headquarters in Chicago, the ideal entry point to Canada, just across the border, and the focus of crime and violence. Such were these unforeseen consequences of Prohibition that its repeal became a major issue in the presidential election of 1932, before the Twenty-first Amendment repealed the Eighteenth in 1933.

These excesses and violence cannot obliterate the prosperity that Americans enjoyed in these years, buoyed up by technological advances arising from use of the internal combustion engine and practical applications of electricity. Ford founded his automobile company at Dearborn, Michigan, in 1903 and launched his famous Model T in 1909. Before production ceased in 1929 more than 15 million cars had been sold. It was after 1920 that the motor car became an item of mass consumption and ceased to be the privilege of the rich: its price fell from US$1,500 in 1913 to US$760 in 1920 and US$600 in 1929. This long life proved fatal to it, as its main rival, General Motors, reorganized in 1920 along more modern lines, soon accounted for about one-third of American car production, alongside smaller makers such as Chrysler, Hudson and Studebaker. The United States became the leading world car producer, making 4.5 million in 1929, as against 1.9 million in 1920, and Europeans followed the path. The United States alone possessed more cars than the whole of the rest of the world, with a ratio of one car for every five inhabitants, as against one for 43 in Britain and one for 326 in Italy. As a consequence there was a great need to build and improve roads, and in the 1930s the first motorways started to appear in the East of the country. This new infrastructure immediately threatened the supremacy of railways, which until then had played a key role in the development and westward movement of the country.

New applications of electricity were also an important source of useful inventions. During the 1920s, as many dams were built as had been built since the discovery of hydroelectric power, so that by 1930 the whole of urban and suburban America was supplied. Rural America lagged behind because of the high costs of installation, especially in the South, where private companies hesitated to invest. Giant corporations grew up both for the production of electricity and for the manufacture of equipment, engines, lighting, appliances and accessories, with a very high degree of concentration to the benefit of firms such as General Electric or Westinghouse.

The nearly coast-to-coast availability of motor cars and electricity transformed everyday life, encouraging the abandonment of cities in favour of the suburbs and improved material conditions. The American went to work in his Ford or his Chevrolet and at the end of the day returned to the bosom of his family, partly liberated from domestic tasks through the use of household appliances that had become common in middle class homes. A new appliance, the refrigerator, left its mark on the language (frigidaire). An appliance that had an even greater impact on society was the radio, with the first commercial broadcast being made in Pittsburgh in 1920. In order to sell their products, makers of radios set up stations, which were soon taken over by national networks dominated by big broadcasting groups, such as NBC (National Broadcasting Company, 1926) or CBS (Columbia Broadcasting System, 1927). In addition to news and entertainment, the radio carried religious broadcasts, and later became a political instrument. The first medium to rival the newspaper had come into being.

Electricity lay behind the success of cinema, which became the most popular form of entertainment. The 1920s saw the triumph of the silent film, whose studios deserted the East Coast to settle in Hollywood under the clear skies of California. There too, big companies – the majors, as they were known – monopolized production: Paramount, founded in 1912, United Artists, launched in 1921 by D. W. Griffith, Charlie Chaplin and Douglas Fairbanks, Warner Bros (1923) and MGM (Metro-Goldwyn-Mayer, 1924). By then the star system dominated, with the likes of Greta Garbo, Gloria Swanson or Mary Pickford alongside Rudolph Valentino. The appearance of talking cinema, in 1927 with *The Jazz Singer*, revolutionized production and led to the appearance of new stars, while at the same time reinforcing the grip of American studios which, year in year out, showed 500 films, in 23,000 darkened rooms, before some 115 million spectators.

All these practical mass applications required investment capital, which ensured the success of Wall Street. Prosperity appeared to be never-ending, with profits rising year after year, whence the infatuation with the Stock Exchange, with all its excesses, the creation of ghost companies and the exploitation of the public's credulity by crooks. But this stereotype needs to be tempered, since only a minority let itself be attracted by the mirage of easy money. Alongside this luxuriating and rich America there coexisted a more conservative and traditional America well portrayed by Sinclair Lewis in *Main Street* and *Babbitt*, two novels that stigmatized the world of the middle class, the world of the small towns of the Midwest, with its own ways, its narrow conformism and its petty bourgeois prejudices. The weight of tradition was at the centre of many affairs of the time, including the one in 1925, involving a Tennessee high-school teacher by the name of John Scopes. He was charged with violating state law by teaching Darwin's theory of evolution. In Tennessee it was unlawful 'to teach any theory that denies the story of divine creation as taught in the Bible'. Two years later, the execution of Nicola Sacco and Bartolomeo Vanzetti, who were convicted of having murdered the paymaster of a New England firm in 1920, put an end to a *cause célèbre* that had mobilized both Americans and Europeans. It was their misfortune to be both immigrants and anarchists. In the 1928 presidential elections, the Republican Herbert Hoover easily defeated the Democrat Alfred Smith, who was criticized for being a Roman Catholic. However, the most lasting manifestation of this alleged return to traditional values was the drastic restriction of immigration through the introduction of national quotas.

There were also several sectors of the population that prosperity bypassed. After having greatly benefited during and after the war from guaranteed markets for their cereals, meat and cotton, by 1925 farmers were faced with surpluses. Stocks were rising, outlets were closing and prices were in freefall, causing discontent in the farming areas of the Midwest. The Republican administration, faithful to liberalism within and protectionism at the borders, refused to pay any heed to their complaints, thereby risking the loss of their votes. But discontent was also building up in the labour force. Prosperity favoured competition at the expense of unskilled and hence less well-paid wage earners, especially because African Americans, attracted by the shortage of labour in the major industrial areas, took over many jobs previously occupied by immigrants. Moreover, the migration of African Americans was far from over, indeed quite the reverse, creating social tensions in the ghettos of cities like Philadelphia, Boston, Chicago and Detroit. The trade union movement was the victim of this malaise, losing about half its members. The dominant organization, Samuel Gompers' American Federation of Labor, drew its membership from among skilled workers, leaving the majority of workers to their fate or to 'house unions'.

## The crisis

The two engines of prosperity, car-making and construction work, slowed in the closing years of the decade, without anyone paying much attention, since Wall Street continued its dizzying rise. The reasons for this slowdown lay in market saturation and the decline in investment: despite a decline of 22 per cent in car production in 1927, the euphoria persisted.

The spectacular collapse of Wall Street, which in three weeks (October–November 1929) lost over US$30 billion in value, set off panic in financial and banking circles. Despite repeated interventions, the decline continued and even worsened in the following months, reaching bottom in 1933. The Wall Street crash had equally devastating effects on the economy, because it occurred in an already weakened conjuncture and an atmosphere of speculation. By undermining the confidence of Americans, it led automatically to a fall in consumption, which reduced production in every area.

At first sight, it seems that it was the rural areas, which had already suffered falling prices, that were most affected. The fall simply accelerated, making farmers the most spectacular victims of the crisis. Every branch of industry had to cut its output drastically, beginning with the car industry, where Ford laid off 72,000 workers in 1931, and, in turn, business slowed. The most visible effect, and the most worrying, was the increase in unemployment, from 4.5 million in 1930 to 12 million in 1931 and 16 million in 1933, although, in the absence of reliable statistics, these figures understate the reality. Poverty was visible in the cities, where the unemployed attempted to sell apples at street corners and queued at soup kitchens. Unable to pay their rent, they had been evicted from their lodgings and gathered in slums, ironically nicknamed Hoovervilles. The already precarious position of farmers was dramatically aggravated by the wave of drought and sandstorms that ravaged a number of states in the Midwest, forcing them to flee westward, where they hoped to escape the 'dustbowl' and find Eldorado. No one has better told the story of the plight of these 'Okies' than John Steinbeck in *The Grapes of Wrath*.

Distress led to discontent and social unrest. While they awaited the promised bonus, veterans of the 1914 war had set up their camp on the banks of the Anacostia River, near Washington, D.C., whence the name 'Bonus Army'. When Congress refused to pay the bonus, some went home, while others stayed. To restore order, President Hoover called out federal troops who, under the command of General Douglas MacArthur, used cavalry and tanks to disperse the veterans, a few months before the 1932 presidential election.

There have been numerous interpretations of the 1929 crisis, none of which is totally satisfactory. Contemporaries saw it as a logical consequence of the Wall Street crash, but none of the previous crashes – and there had been many – had had such a devastating effect. For John K. Galbraith, 'Had the economy been fundamentally sound in 1929 the effect of the great stock market crash might have been small ... on the contrary it was exceedingly fragile. It was vulnerable to the kind of blow it received from Wall Street'. For Charles Kindleberger the American crisis reflected the collapse of the world economic system as a result of the American refusal to play a stabilizing role. Milton Friedman blamed the monetarist policy of the Federal Reserve which, by raising its rates, tightened the money supply and removed any elasticity that might have assisted a revival. In fact, the American crisis had multiple causes, both endogenous and exogenous, something that contemporaries and actors, attributing a surely excessive role to stock market speculation, were unable to see.

Contrary to a deep-seated myth, the administration did not simply fold its hands in the face of poverty, at either local or federal level. In New York State, which had just elected Franklin D. Roosevelt as governor, his associate, Frances Perkins, worked hard to help the unemployed by paying them relief and opening soup kitchens and shelters for those evicted from their homes. As for the federal government, it took measures designed to halt the fall in farm prices, offer credit to firms in difficulties (Reconstruction Finance Corporation) and help banks (Glass-Steagall Act). Nothing seemed to work, and the crisis persisted.

## The New Deal

It was amid this gloom that the 1932 elections were held, which brought the Democrats to power with their candidate F. D. Roosevelt, who won easily with almost 58 per cent of the votes. On his coat tails, they also won control of both houses of Congress. The Republicans had never suffered such a defeat before, losing 42 of the 48 states, and holding out only in New England, Pennsylvania and Delaware. A new era dawned, the New Deal, to use the expression coined by the new president.

Pragmatism and opportunism were the hallmarks of this experiment, which lasted until 1938. Roosevelt had won by his personality, his persuasiveness, good use of the media and, of course, the fact that the Republicans were worn out after twelve years in office, rather than by the presentation of a programme, a notion quite foreign to his personality. Just 50 years old, he belonged to a well-known

family from Hyde Park, New York, and benefited from the fame of his distant cousin Theodore 'Teddy' Roosevelt, who had served as president of the United States from 1901 to 1909. Franklin D. Roosevelt served as Assistant Secretary of the Navy in 1915, and then in 1920 was the losing candidate for the vice-presidency. Struck down the following year by poliomyelitis, he fought against the paralysis that affected his lower limbs for the rest of his life but, while remaining an invalid, recovered his taste for politics, and was elected Governor of New York in 1928, and re-elected in 1930. The most popular president of the twentieth century, he managed to win re-election three times (1936, 1940, 1944), thus breaking a taboo that dated back to George Washington's having declined to accept a third term in office.

The New Deal saw increased intervention by the federal government in economic and social life, and an enhanced role for the bureaucracy. Alongside the traditional cabinet, which remained very stable during these years, a private group of advisers operated the 'brain trust', in which economists, academics, various experts and businessmen quickly followed one another, depending on what the issue was. The cabinet acted as a facade for what was the real engine of government action, transmitted less through the traditional machinery than through more and more agencies emanating directly from the executive. This marks the beginning of an 'imperial presidency' which gave the president a status previously unknown, except in the time of Lincoln, during the Civil War. And beyond Congress, warm contact was assured between the president and Americans through his Saturday evening 'fireside chats' and White House press conferences. A new style of government came into being, supported by radio; television was yet to come.

The New Deal advanced in stages that reflected not an overall vision, but in response to the pressure of events, the main object being to restore confidence and get Americans back to work. The first measures, in 1933, were taken for the economy, to save the banks, restore credit, stimulate farm and industrial production and sustain prices. They ended in January 1934, with a devaluation of the dollar that was supposed to ensure more flexibility in the economy. At the same time, specific actions were undertaken to reduce unemployment, especially through public works, such as the Tennessee Valley project that developed the whole river basin through flood control and electrification. A second set of measures, a prelude to the welfare state, was launched in 1935; it included the creation of social security, paying of pensions to retirees and benefits to the unemployed. A final set of measures was launched in 1938, which attacked the monopolies held to be partly responsible for the malfunctioning of the economy. In fact, it marked the resumption of a policy specific to the Democratic Party, already partly pursued by Wilson.

Did these measures get the Americans out of trouble? The answer is unclear, for two reasons. The recovery was slow, uneven and disappointing. There was progress, but in 1937, the United States had still not recovered its 1929 level, despite the pick-up of industrial production, the recovery of wholesale prices and, an essential indicator, the rise in national income. Yet unemployment was far from over, since there were still 7.5 million people unemployed. And then, suddenly, the recovery ground to a halt, and the economy once again plunged into recession. Although

previously rejected, Keynesian methods of budget deficits, public expenditure for employment and the opening of new public works projects finally saved the day. At the end of 1938, the president could declare: 'We are once again on the right path'. The following year production recovered its 1929 level, but two black spots persisted: unemployment and trade.

The grim face of this period should not be allowed to conceal one of its brighter aspects, which emerged from the explosion of cultural activities. Contrary to Tocqueville's assertion that Americans were not interested by culture, the novelist Sinclair Lewis was awarded the Nobel Prize for literature in 1930, followed by Eugene O'Neill, Pearl Buck, and, later on, Faulkner, Hemingway and Steinbeck. The Harlem Renaissance confirmed the birth of an African American literature, whose big names were Langston Hughes, Arna Bontemps, William E. B. DuBois and many others. At the same time, after its beginnings in New Orleans and Chicago, jazz exploded thanks to such interpreters as Louis Armstrong, Count Basie, and Benny Goodman. Jazz was also incorporated into more classical works like the compositions of George Gershwin, who, inspired by DuBose Heyward's *Porgy*, composed his *Porgy and Bess* for an all Black cast. Another even more striking facet of this uniquely American cultural trend was its popular productions and musicals, which triumphed on Broadway's stages, not to mention the westerns, rodeos, and all-powerful cinema, where a new generation represented by Charles Laughton, Humphrey Bogart, and Katherine Hepburn was making its way, whereas cartoon movies were popularizing Mickey Mouse, Donald Duck and many other well-known characters.

If the New Deal was not an economic success, it certainly stirred up the country. There was violent opposition to Roosevelt, accused in turn of being either fascist or socialist, and criticizing his interventionism. But his charisma ensured him wide popularity among Americans, confirmed by their increasing participation in elections and symbolized by his triumphant re-election in 1936 when he carried every state except Vermont and Maine. Roosevelt was able to galvanize the American people and restore their confidence, even if the results were mediocre. The federal government doubled the number of civil servants, which proved to be an adequate means of fighting unemployment. But it was in the world of labour that the changes were most felt. Farmers' incomes eventually improved, and workers, following official recognition of trade unions, earned the right to collective bargaining; ever after they could negotiate directly with employers. The trade union movement was democratized, opening up to unskilled workers through the new CIO (Congress of Industrial Organizations), which emerged following a split with the more traditionalist AFL (American Federation of Labor).

## FROM ISOLATION TO INTERVENTION

After its decisive intervention alongside the Allies, the United States returned to its traditional isolationism, confirmed by the Senate's rejection of the Treaty of Versailles, the defeat of the Democrats at the 1920 elections and the signing of a separate peace with Germany.

In fact, this was only a surface appearance, since the reality was more complex. The war had effected a shift in the

economic centre of the world from Europe to America, and New York became the nerve centre of business at the expense of Paris and above all London. This totally transformed the world economy, although the main actors were not truly aware of it. At any event, there was no way the United States, given its creditor position, could remain politically indifferent to what was happening across the Atlantic.

The paradox is, however, that Americans were more present in international relations under Republican administrations than under Democratic ones. In order to ensure their preponderance at sea, following the line laid down by Alfred Mahan, they took the initiative of convening a conference in Washington in 1921 to limit naval armaments, which granted them parity with the United Kingdom – ahead of Japan – and with France and Italy in third position, on the basis of quotas of 5, 3 and 1.75. At the same time, a moratorium on the construction of battleships was declared. While they remained outside the Locarno Pact designed to keep the peace, a rapprochement with Europe began in 1928 with the signing of the Pact of Paris or Kellogg-Briand agreement, which reaffirmed the same principles.

But it was above all in economic affairs that the United States made its presence felt given that it was directly concerned by the question of war debts, associated with those of reparations. Faced with Germany's insolvency and the crisis threatening the international balance, it took the initiative in two plans that bear the names of their American promoters: the Dawes Plan, which proposed scheduling payments under the supervision of an Agent General for Reparations (also an American) and, five years later, the Young Plan. Long before the Marshall Plan, the reconstruction of Europe had become a priority on the other side of the Atlantic. But the economic crisis of 1929 put an end to this collaboration, with President Roosevelt rejecting the proposals of the World Economic Conference that met in London in 1933 on the initiative of the League of Nations, to reach an economic understanding among states. Domestic recovery relegated the international situation to the back burner.

This is what gave rise to the dominant impression of withdrawal from the international stage, although isolationism was never total. Thus, after a break of more than ten years, the United States was the last great power to re-establish relations with the USSR, although without any major results. Conversely, relations improved markedly with the countries of the American continent, thanks to settlement of an old dispute with Mexico, the ending of the protectorate over Cuba and regular participation in pan-American conferences. In trade, the rigours of protectionism were tempered by the signing of bilateral agreements based on reciprocity and a most favoured nation clause. But the dominant concern remained that of observing strict neutrality, whether in relation to Japanese initiatives in Manchuria and China, Italian conquest of Ethiopia, the Spanish Civil War or the outrages of Nazism. To each *coup de force* Congress responded by tightening up neutrality, while entry to the country remained obstinately closed to the victims of persecutions.

The defeat of France in 1940 and the loneliness of the United Kingdom led to a gradual abandonment of the policy of neutrality. The United States now deemed itself directly threatened, both in the Pacific by the Japanese, and in the Atlantic by Germany. These events moved Roosevelt to seek a third term as president. Re-elected with 55 per cent of the votes – fewer than in 1936 (60 per cent), although very comfortably (he carried 38 states and retained the majority in Congress) – he took advantage of this honeymoon period to begin the country's rearmament and support the United Kingdom. Going against a public opinion still hostile to any intervention, he seized the initiative to lead it and impose his views on Congress by measures such as lend-lease. Not hesitating to portray himself as the defender of the free world, he proclaimed the 'Four Freedoms' that were fundamental in a democratic society, and, in the Atlantic Charter, sketched the outlines of the future world.

But it was the surprise attack on Pearl Harbor on 7 December 1941, destroying much of the American fleet and air force, which provoked immediate entry into the war against both Japan and Germany. Traumatized by this blow, opinion rallied behind its president in an outpouring of patriotism and holy union for victory.

## FROM DEFEATS TO VICTORIES

In the six months that followed, the Japanese exploited the surprise effect to the hilt, driving the Americans out of their forward positions in the Pacific, Guam, Wake and the Philippines. After also driving the British, Dutch and French from their colonial positions, they had become the masters of the situation. Despite these initial defeats, the United States, now the lynchpin of the coalition, reorganized itself and prepared to reclaim Allied supremacy by driving the Japanese out.

### A country at war

The country's economy was very efficiently mobilized, following guidelines set out by Roosevelt: 'We must be the great arsenal of democracy … Manufacturers of watches, farm implements, linotypes, cash registers, automobiles, sewing machines, lawn mowers and locomotives are now making fuses, bomb packing crates, telescope mounts, shells, pistols and tanks.' The targets set were ambitious: 125,000 planes, 75,000 tanks, 10 million deadweight tons of shipping by 1943. The production effort was enormous: new factories emerged from the ground in a few weeks and naval shipyards were opened on both coasts, to meet the needs of all the Allies – the British as well as the Soviets.

Two original creations symbolize this reconversion and help explain its ultimate success; the key lay in innovation and standardization. The naval shipyards produced a single type of transport vessel, the 'Liberty ship', constructed out of prefabricated elements assembled by welding, and not soldering, by teams often composed of women only. Initially, assembling them took six months, but by the end of the war it was being done in two weeks. In this way 56 million deadweight tons of ocean transport were built in five years. In the car industry, partly converted to aircraft construction, a new all-purpose vehicle called the 'jeep' was designed to meet all uses, and became the norm. Thanks to the impetus given by the War Production Board (WPB) and despite bottlenecks (the most serious of which involved replacing rubber from Malaya by rubber from Brazil), overall the targets were met, whether for tanks, airplanes or weapons.

Under this War Production Board, which operated until the end of 1945, aided by a large number of agencies, production was organized bureaucratically, using the Great War precedent. A large number of federal agents were recruited to manage the effort; their numbers increased from 1 to 3.3 million in three years. These agencies were responsible for carrying out programmes and controlling prices – to avoid any slippage, illicit profits or illegal deals, as well as to ensure there was no discrimination based on sex or race.

The social implications of this economic mobilization were considerable. The number of wage earners rose from 32 to 41.5 million, 17 million of whom were unskilled labourers, an increase of 30 per cent. Women played a prominent role in this labour force, accounting for 15 million jobs, many of which were previously reserved for men, but also taking their place in new jobs in the tertiary sector. Thus, by 1943, unemployment had completely disappeared to be replaced by a labour shortage, which encouraged the advancement of African American and Hispanic minorities.

Even more than during the First World War, African Americans flocked to the urban industrial areas and California. They often met with resistance and even violence, were offered jobs at lower wages and above all were exploited by slumlords, despite Executive Order 8802 of 1941 that proclaimed: 'There shall be no discrimination in the employment of workers in defence industries or government because of race, creed, colour, or national origin'. The number of African American workers doubled in industry, especially in iron and steel, where they held a third of the jobs, and in shipbuilding on the Pacific coast. Their growing presence in businesses as well as in the public sector created palpable tensions, sometimes leading to riots, as in Detroit, Mobile and Harlem in 1943. It was the same with Chicanos (Mexican Americans) in Los Angeles, where they were involved in clashes with Whites. However, despite this unrest, the participation of ethnic minorities in the war effort had a decisive effect on the transformation of American society.

Other minorities also had their victims. Whereas neither German Americans nor Italian Americans were hassled, Pearl Harbor triggered real hysteria against first (*Isei*) and second (*Nisei*) generation Japanese settled in California, where they were regarded as a threat to public security. Over a hundred thousand of them who lived in the Pacific states were arrested in June 1942 and interned in improvised camps in remote areas of northern California and Wyoming, where nothing had been prepared to receive them. When they were finally allowed to return home, after the end of the war, they often found their property confiscated. It took several decades of litigation for them to win compensation for the injury done to them.

## Strategy and tactics

Military mobilization relied on conscription, instituted even before the beginning of the war for all men aged 18–35, and later extended to 38. Yet once mobilized, African Americans were not treated as full citizens, as strict segregation continued to be enforced in all three arms, particularly in the navy. Of the 20 million Americans liable to be called up, some 15 million were actually enlisted, two-thirds of them

in the army. Of the two hundred divisions originally planned, only 70 were actually constituted. After quick training in camps, most of which were located in the South, which perpetuated the military tradition of the Civil War, they were sent to the various theatres of operation. Special efforts were made to train shock troops such as marines, parachutists and green berets. The American army stood out for the scale of its support services, which absorbed as many men and women as the fighting units.

Strategically, everything had to start from scratch. A unified high command, the Joint Chiefs of Staff, had been constituted in 1939 under General George Marshall. Even before entry into the war, plans had been drawn up. Following the attack on Pearl Harbor, a choice had to be made. As it was going to be necessary to fight on two fronts, three questions arose: Which front should be given priority? How could lines of communication between America and distant theatres be ensured? Should frontal or peripheral offensives be launched? All these questions were discussed at the highest level, in the presence of President Roosevelt as Commander-in-Chief. First there were conferences with the British and Canadians (Argentina in 1941, Arcadia in 1942, Trident and Quadrant in 1943, Quebec in 1944), then with all the Allies, including the Soviets (Tehran in 1943, Yalta in 1945). In addition to strategic choices, these conferences also dealt with political aims. Thus two fateful decisions with important consequences were taken: at Casablanca, in 1943, to impose unconditional surrender on the enemy and, at Yalta, that the USSR should enter into the war against Japan.

The strategic options gave rise to sharp confrontations, which can be traced to differing conceptions among the participants. From the beginning, despite pressure from General Douglas MacArthur, commander of land forces in the Pacific, priority was given to the liberation of Europe, at the expense of the territories conquered by the Japanese. The strategy was bound to be different between Japan and Europe. With regard to the former, the views of the army (MacArthur), whose priority was the reconquest of the Philippines, clashed with those of the navy (Admiral Nimitz), who pushed for reoccupation of the archipelagos by combined operations using 'island hopping' tactics. A compromise was agreed which left Nimitz responsible in the central Pacific, and MacArthur in the southern Pacific. In this sector, the Americans had the advantage of being in sole charge of operations, although this did not eliminate the difficulties arising from both the dogged determination of the Japanese and the harshness of the tropical climate. They regained the upper hand in the central Pacific with the battle of Midway, in June 1942, and, in the south, with the battle of the Coral Sea. Despite these initial successes, the reconquest was exceedingly slow, partly because the high command had thought it could count on cooperation with China, which would have been an excellent springboard for attacks on Japan. This hope never came to anything, because of corruption in the Chinese Government and the civil war ravaging the country. After two years of merciless fighting, the Americans had only reached the outposts of the Japanese archipelago. MacArthur had landed in the Philippines in 1944, after the naval victory at Leyte, but met with fierce resistance there, which was also the case in the Bonin archipelago, where Iwo Jima became the symbol of Japanese determination in the face of American heroism.

In Europe, seen as the priority area, the situation was totally different, since there were the British and Soviets to deal with. Aiming to ensure their lines of communication with the Allies, the Americans remained faithful to their strategy of establishing secure naval bases in the Caribbean, Newfoundland, Iceland and Greenland. The strategic choices related to the opening of a second front, repeatedly called for by the Soviets at the Tehran conference, but the nature, date and location of this remained to be decided. Faced with the might of the German army, a massive attack would be required; this called for both a considerable strike force and the availability of rear areas where the force could be prepared, close to the sites of the future landings. The Canadians' raid on Dieppe in 1942 had revealed the hazards of such an adventure, and in spite of the repeated pressure from the Soviets, the Americans were not ready to venture on before a long preparation period backed by adequate equipment. On this point, they disagreed with the British, who advocated a peripheral strategy that called for attacking Europe's 'soft underbelly' – the Balkans, and then central Europe. In the end, they decided to proceed in successive stages, with, in 1942, Operation Torch in North Africa, and then in 1943 Husky in Sicily and Avalanche in Italy. The twin attacks in 1944 in Normandy (Overlord) and Provence (Anvil) were a success in terms of combined operations, but a strategic failure, in that the German army was able to escape the pincer movement and regroup to launch an attack in mid-winter in the Ardennes that stopped the American advance in its tracks (Battle of the Bulge).

Victory was already in sight when the last conference attended by President Roosevelt met in Yalta to sketch the future outlines of Europe and coordinate the effort against Japan. Concessions were made to Stalin in the Far East in order to gain Soviet support against Japan. Stalin promised secretly to enter the war against Japan within three months of the unconditional surrender of Germany. The United States was in a weak position at the conference, with the Soviets occupying much of the continent and an ailing and exhausted Roosevelt unable to put up much resistance to Stalin's demands on the western borders of the USSR and its advance into central Europe. Yalta signified recognition by the Western Allies of a de facto situation, in which the Soviet army was present in the heart of the continent. Whether they liked it or not, the Americans could only be grateful for Stalin's willingness to help them fight Japan. A few weeks later, Roosevelt died without being able to witness Germany's surrender on 8 May 1945.

**The atomic weapon**

As the war continued in the Pacific, the last bastions of the Japanese defence crumbled one by one. In April 1945, the Americans landed on Okinawa, the closest point to the archipelago, without however being in a position to attack it. The anticipated delay of a year between the surrender of Germany and that of Japan threatened to involve heavy human losses, as the recent past demonstrated. Should the end of hostilities be hastened? The explosion of an atomic bomb on 16 July at Alamogordo in the New Mexican desert showed that the United States possessed the absolute weapon; but should it be used? On 6 August, the *Enola Gay* dropped an atomic bomb on Hiroshima, causing tens of

thousands of civilian casualties, and three days later the city of Nagasaki suffered the same fate.

The dropping of the atomic bomb marked the culmination of a project which went back to 1939 when Einstein, a refugee in the United States, drew Roosevelt's attention to the new prospects opened up by manipulation of the atom: 'This new phenomenon would also lead to the construction of bombs of an extremely powerful type'. Roosevelt was interested in this project, and appointed a committee in late 1939, which was the origin of the top secret project code-named Manhattan and launched two years later. Anti-Semitism and other events in Europe had brought many of the world's best physicists to America, including the Dane Niels Bohr, the Italian Enrico Fermi, the British Leo Szilard and the Hungarian Edward Teller. The first bombardment of an atomic nucleus was achieved in 1941, in a laboratory at the University of Chicago, following by experiments entrusted to three test centres under federal responsibility – Oak Ridge in Tennessee, Hanford in Washington and Los Alamos in New Mexico – where the bomb was designed under the leadership of Robert Oppenheimer. The small circle of those in on the secret that the United States might be overtaken by Germany, pushed for completion of the project; President Truman, who assumed office when Roosevelt died, was not informed until the Potsdam conference in July 1945.

He took full responsibility for this crucial decision, however, which forced the Japanese Government to surrender immediately after the Nagasaki bombing. On 15 August 1945, the war ended in the Pacific.

Nevertheless, once the euphoria of victory had passed, the use of the atomic bomb raised many questions, both moral and tactical. Was it legitimate to use such a terrifying weapon to compel an enemy to yield, even one that was determined, but still close to defeat? Should not a warning have been given first, as civilians associated with the project had suggested? The justification was that Japan was not ready to give in by ordinary means and the fighting would have gone on for a long time. In the atmosphere prevailing at the time, the Allies were anxious to end as quickly as possible a conflict that had already lasted for almost six years and had been as lethal for civilians as for the military. Morally, use of the atomic weapon was objectively highly questionable, but for people at the time, it put an end to a nightmare, even while portending that there might be another. Some have suggested that the Americans had other motives on the eve of the USSR's entry into the war against Japan, hypothesizing that the bomb also served as a warning to its great rival. That reasoning would attribute to President Truman a Machiavellianism that his behaviour belied. A more plausible explanation is the accumulated hatred built up among Americans since the 'Day of Infamy' when Pearl Harbor was bombed in a sneak attack and the harshness of the war in the Pacific. It remains that possession of the atomic weapon undeniably ensured military superiority and thus the political supremacy of the United States in a world that was entering the era of the *pax Americana*.

## THE RISE OF CANADA

When a book that had originally appeared in 1906 with the title *Le Canada, les deux races* was reissued in 1947, the author, sociologist André Siegfried, gave it a new title: *Le*

*Canada, puissance internationale.* This change highlighted Canada's arrival on the international stage. Like the United States, it was a newcomer in the concert of nations, but this came at the end of a long process. Canada had moved from being a dominion of the British Empire to being a member of the Commonwealth, from a semi-colonial stage to independence in successive steps accelerated by its active participation in the two world wars.

The similarity with the United States goes farther than that. Like the United States, its formation was the result of successive waves of immigration from Europe, quadrupling its population over the course of the twentieth century. But it differed in the process of settlement and the origins of its founders.

The settlement of Canada was linear, with the inhabited part no more than a narrow strip stretching along the 49th parallel from ocean to ocean, leaving the remaining territory, the second largest in the world by area, practically empty. Unlike the United States, Canada did not experience any 'frontier', and this feature was confirmed in the twentieth century.

Rather, the origin of its founders, French in Lower Canada (the valley of the St Lawrence and Quebec), and British in Upper Canada (Ontario), imposed the coexistence of two cultures living side my side in mutual ignorance. Far from disappearing, this duality was kept alive by nationalist currents that made Canada a composite state of sharply differentiated regional groupings: the Maritimes, Quebec and Ontario (the 'cradles' of Confederation), the Prairies, the Western Provinces, plus the sub-Arctic territories occupied by the First Nations (Indians and Inuit). Communications between them remained difficult, especially given the distances.

Unity among these highly diverse groupings was ensured by a unique political regime of Confederation. Each of the nine Provinces (later ten following the accession of Newfoundland in 1949) had its own government, with its parliament and its prime minister, according to British tradition, and a governor representing the monarchy. In Ottawa, capital of the Confederation, there was an analogous structure: a governor-general, who appointed the prime minister, responsible to a two-chamber parliament (elected House of Commons, appointed Senate). The constitution still in force was the British North America Act of 1867, under the sole responsibility of Britain's parliament.

## Canada and the world

Canada's entry into the international community was facilitated and accelerated by its role in the two world wars, in which it participated directly, making a considerable human contribution, given a population of only 8 million inhabitants. In 1914, 600,000 men were mobilized, 420,000 of whom saw service overseas, in particular on the French front, on the Somme and in Artois. Twenty-five years later, out of a population of 12 million, one million men and women served in the armed forces and fought in both Europe and Asia. Canadians carried out the bloody Dieppe raid in 1942, which acted as a dry run for the Normandy landings two years later, and played an effective role in the battle of Normandy and the liberation of France and the Low

Countries. In addition, during the Second World War, Canada was transformed into a rear base for both the United States and Britain, producing canons, tanks, aeroplanes and other war materiel and serving as a training base for all the British air units. The conflicts hastened the country's transformation from being a supplier of agricultural staples and raw materials to being a producer of industrial equipment, and precipitated the transformation of society through a massive resort to employing women in war factories. Women won the right to vote in 1920, except in Quebec, where they had to await the end of the Second World War.

The immediate consequence was the entry of Canada into the club of Great Powers. During the First World War, Canadians had fought under British command before securing an autonomous brigade, but in the Second they had their own units in every arm. In 1919, Canada sent its own delegation to the peace conference and occupied a seat at the League of Nations and in the International Labour Office. It was the first step on the path to sovereignty that was completed with the opening of the first foreign legations: even before the establishment of a ministry of external affairs, which only came about in 1946, a legation was opened in Washington in 1920, with others following in Paris and Tokyo. This independence was made official by the Statute of Westminster in 1931, but the British sovereign continued to be represented in Ottawa by the governor-general, who was himself always of British nationality until 1952, when the Canadian Vincent Massey opened the way to the Canadianization of this post, which had in fact become increasingly honorific. A new stage of sovereignty was reached in 1949 with the creation of a Canadian nationality as distinct from British nationality, and the adoption in 1964 of the maple leaf flag in place of the Union Jack. In half a century, Canadians, while remaining loyal members of the Commonwealth, had successfully acquired all the attributes of sovereignty, except for control of their constitution.

## Political life

Political institutions were based on a two-party system, with Conservatives and Liberals alternating in power. The latter, under the leadership of Wilfrid Laurier, the first French-speaking prime minister, held power for almost twenty years early in the century. The dividing-line between these two parties was shifting, since they lacked ideology and had no set territorial base, although Ontario tended to be more conservative. The Liberals were more inclined to reforms, more distanced from the metropolitan power and advocates of free trade, which would draw them closer to their neighbour to the south. But Laurier's moves in this direction ultimately failed, following the Conservatives' refusal to weaken traditional links with the mother country. Following the First World War, a long Liberal period began, dominated by the personality of Louis Mackenzie King, who was prime minister for over twenty years, with an unbroken stretch between 1935 and 1948.

The two-party system was challenged by the sudden emergence on the political stage of the Western provinces: getting no response to their specific aspirations from the two main parties, they manifested their difference by creating regional parties. Farmers in the West were being

hit by the high cost of transporting their agricultural produce to Montreal and Toronto. To counter the omnipotence of the railway companies, they set up cooperatives and unions whose demands were taken up by a Progressive Party, which, in 1921, upset the traditional balance by winning a large number of seats in the Ottawa parliament. From then on regional third parties were a constant feature of Canadian political life. The short-lived Progressives were followed by the CCF (Cooperative Commonwealth Federation), rooted in the Prairies, which portrayed itself as the defender of farmers and workers and called for greater state intervention in the management of the economy and social matters. It was a socialist party, without actually calling itself such, and inaugurated a social-democratic trend that was present in political life right through the century. Conversely, the Social Credit Party, founded in Alberta by an evangelist who was a past master at media manipulation, the Reverend William Aberhart, skilfully mixed evangelism and populism to denounce the financiers and capitalists in the East and call for a 'social credit' that would enable all to enjoy a life of ease. Such language could not fail to please and ensure the success of the Social Credit Party in Alberta and British Columbia, although its short-lived rise was associated with the Great Depression. In this way, the provinces in the West and the Prairies now made their mark on political life.

Canadian society was heavily dependent on the economic situation. Following the First World War, a decade of genuine prosperity opened, marked by a resumption of immigration (over a million arrivals), the return of investors, rising agricultural production in the Prairies, high levels of exports and a general improvement in the population's standard of living. As war had exhausted Britain, Canada turned increasingly to its neighbour to the south, which became the new source of investment, attracted less by the public utilities than by the extraction and processing of raw materials, like the manufacture of paper pulp (Canada is the main supplier of newsprint to the American press), or engineering (the suburbs of Toronto became an annex for the car-makers of Detroit). In the background of this industrialization began exploitation of the vast hydroelectric potential that lay in Canada's natural abundance of water. This development accentuated the contrast between the agricultural provinces in the West and the now industrialized ones in the Centre. Thus, in 1928, the two provinces of Ontario and Quebec alone were responsible for more than three-quarters of industrial production. In terms of trade, dependence on the United States grew steadily at the expense of Britain.

## The Depression

This state of affairs plunged Canada into the gravest crisis it had ever suffered: the 1930s were years of recession, destitution and an explosion of poverty. As an exporter of raw materials (cereals, lumber, metals) and semi-processed products (paper pulp), Canada was a victim of the fall in world prices and the collapse of international trade, which primarily affected wheat and meat producers in the Prairies. After borrowing to equip themselves, farmers saw their incomes fall, leaving them only one way out – to abandon their farms, and perhaps go further west, in the hope of finding work: Canada too had its 'Okies'. As the United States stopped its purchases, it was industry's turn to be affected by the build-up of stocks, devalued and unsaleable, and then the turn of Quebec, Ontario and British Columbia to be hit. The sharp fall in living standards wiped out the gains of the previous period and favoured the successes of third parties, which enjoyed their best years. But the provinces were too poor to react, and the federal government remained impotent and powerless to deal with this depression. The few conventional emergency measures that were adopted, like restricting immigration, raising customs duties, establishing imperial preference within the Commonwealth or setting up work camps, were totally inadequate. A 'little New Deal', directly inspired by Roosevelt's, was launched by the Conservative government of Richard B. Bennett, who resigned himself to intervention through such measures as creation of the Bank of Canada; but some were held unconstitutional by the Privy Council in London and were immediately annulled.

The Great Depression laid bare the weaknesses of the Canadian economy because it was over-dependent on the outside world, but it also showed up the impotence of the federal government. In 1937, the Liberal prime minister Mackenzie King returned to power and, very conscious of its weakness, set up a Royal Commission, known as the Rowell-Sirois Commission (from the names of its chairmen), to draw up proposals to make institutions work more efficiently. For this first revision of the constitution since the 1867 Act, the response, delivered in 1940, was clear: some of the powers held by the provinces in social, economic and fiscal affairs must be transferred to the government in Ottawa, which in particular must be given the right to raise direct taxes, in exchange for compensatory payments. Despite opposition from some provinces (including Quebec) to this transfer of powers, centralization was stepped up and a form of federalism came to dominate political life.

## War and the aftermath

This reorientation coincided with the entry of Canada into the world conflict, which led to profound changes in the country. The needs of war put the whole apparatus of production back to work through its modernization, so that Canada entered the small group of world industrial powers. Full employment, including women, and the accumulation of forced savings, consequent upon the limitation of consumption through rationing, which was reinstated as soon as peace returned, improved the everyday life of Canadians. The Prairies recovered their prosperity through food exports to Europe. Canada's loans to the mother country meant that the Dominion moved from being a debtor to being a creditor nation. Finally, with its Big Neighbour to the south, the conflict sealed a strategic, diplomatic and even scientific collaboration that, among other things, enabled Canada to participate actively in Allied nuclear research.

At the same time, the country embarked deliberately on the creation of a welfare state. This involved the introduction of unemployment insurance, along with family allowances, the beginnings of a bold social policy, added to a system of medical cover and retirement pensions. In this area, Canada, unlike the United States, became one of the most advanced countries in the world. The consequence was the appearance, in both the capital and the provinces, of a predominantly

English-speaking bureaucracy, which played an increasingly important role in the Confederation.

Despite the financial compensation that the provinces now enjoyed, this turn of events was far from being universally well received, especially in Quebec, ever fiercely insistent on its autonomy. Added to these discontents was the old demon of conscription. Although the Canadian Government had committed itself in 1939 not to resort to it – so as not to awaken the dormant nationalism that had burst out in earlier conflicts – the unexpected length of the conflict and the scale of losses forced it to shift its policy. In 1942, following a procedure exceptional in this democratic country, a plebiscite was organized around the principle of conscription. While accepted by two-thirds of Canadians, it was rejected by 71 per cent of Quebeckers (85 per cent of French-speakers). The conscription took a long time to organize and in fact no conscript ever served overseas, but the case showed clearly that far from making it disappear, the war had further accentuated the cleavage between English-speakers and French-speakers, and this cleavage weighed heavily on the country's future

Post-war prosperity enabled Canada to take advantage of the position it had acquired during the hostilities. From being a mere member of the Commonwealth, it became a middle-ranking power, stimulated by the increase in its population, its proximity to the United States and the policy of the federal government.

The growth in population was striking, rising from 11.5 million in 1941 to 17.8 million twenty years later, a rise of almost 50 per cent, unprecedented in Canada. It was a result both of immigration and the baby boom. After years of restrictions and refusal to accept immigrants, including the victims of European dictatorships, immigration reached levels unseen since the early twentieth century, with over 100,000 arrivals a year in the late 1950s, and a total of 2 million between 1946 and 1960. A first wave, made up mostly of Britons, was followed by a flood of Germans, Greeks, Slavs and Italians. Meanwhile, the baby boom ensured that the population was getting younger and opened the way for a new generation that would stimulate economic and cultural activity.

Industry, now oriented towards civilian activities, endeavoured to satisfy the boom in consumer demand. Full employment was practically assured, the standard of living and expectations were rising, and households were buying cars, household appliances and television sets, following the American model. Urbanization also accelerated. Despite the prosperity of the agricultural market, rationalization and mechanization of farms led to a reduction of the rural population, which found itself alongside the immigrants in towns that were ever more populous and spread out. In the twenty years following the war, the proportion of the population that was urban rose from 56 to 76 per cent and, in 1961, the rural labour force accounted for only 10 per cent of those employed. The Montreal agglomeration passed the 2 million mark, but it was now closely followed by that of Toronto. The suburbs were much like those of the United States, with their bungalows, their gardens, and, before long, their swimming pools and their boredom. The city centres mirrored the continent with its characteristic division into ethnic districts, each with its own places of worship, schools, shops and signs in Italian, Yiddish, Greek, or Armenian. Communitarianism made its appearance in all the big cities, with its counterpart of multiculturalism.

This shift affected the various provinces unevenly. Immigrants favoured dynamic, English-speaking areas like Ontario, the most industrialized province, which was their first choice along with British Columbia, which benefited from its opening on the Pacific and an outstanding environment. Alberta, hitherto rather left out, took off rapidly following the discovery of oil in 1947. Meanwhile, the Maritimes lost their strategic and commercial advantages once fuel oil replaced coal: Halifax was abandoned as a staging point, and fishing began its slow decline.

As to Quebec, it was in its period of 'great darkness' (*grande noirceur*), under the sway of the Union Nationale government of Maurice Duplessis, a mixture of conservatism, wheeling and dealing, patronage and corruption. It favoured American investors over British ones, but it also retained its stranglehold, relying on a Catholic clergy that was still powerful, wealthy and omnipresent, especially in education, where it had an absolute monopoly. Montreal was still the biggest city in Canada in terms of population and as an economic centre, one where an English-speaking minority dominated the world of business. But it is possible to detect signs of the changes that were about to occur. Thus, the strike launched in 1949 by Christian (Catholic) trade unionists in the asbestos mines ended in victory for the strikers, backed by journalists, public opinion and even part of the clergy in the wake of the archbishop of Montreal. In contrast to traditional nationalism, intellectual trends were emerging that found an outlet in reviews such as *Cité Libre*, whose contributors openly criticized the sclerosis of power, the clergy's opposition to change and the conservatism of society, and called for Quebec to be opened up to the outside world.

For its part, the federal government embarked on new social programmes that consolidated the welfare state. Ottawa intervened in areas previously reserved for the provinces, enhancing its tax-raising capacities, making grants to universities and launching the great Trans-Canada highway that stretched more than 3,000 miles from Newfoundland to Victoria, B. C. This strengthening of central power was increasingly at the centre of constitutional debates.

Finally, Canada increased its presence on the international stage, participating in 1949 in the creation of NATO, which offered it the advantage of maintaining its links with the former mother-country, while moving closer to the United States. On this basis, Canadian troops were stationed in Germany. It played a much-appreciated role at the United Nations in several peacekeeping operations, in Palestine, on the Indo-Pakistan border and in Korea. Using their position as a former colony, devoid of all territorial ambition, Canadians provided contingents of Blue Helmets, which were generally well received. Above all, Canadian diplomacy took the initiative of mediating in the conflict over the Suez Canal in 1956, helping both the British and French to gain an honourable way out. Canada had become one of the Great Powers in the world.

## PAX AMERICANA OR COLD WAR?

Victory in 1945 gave the United States a dominant position in the post-war world and, contrary to what happened in 1918, it equipped itself with adequate instruments. The broad outlines of this world were worked out in conferences

held between 1940 and 1945, from the Atlantic Charter to the Potsdam talks, and owed much to the ideas of their chief inspiration, Franklin Delano Roosevelt. The main thrust was to avoid the mistakes of the inter-war period, and commit the country boldly to peacekeeping alongside its allies, which explains, given the weakness of Europe, the upheavals in Asia and the implosion of the colonial empires, the role that external relations played in American life from this time onwards. In 150 years the United States had become a world power, facing a single rival, the USSR.

In the logic of unconditional surrender by Germany and Japan, no peace conference followed the end of hostilities: the Americans occupied Germany with the Allies; both countries were deprived of their own governments and subjected to military rule. This was an unprecedented situation, demanded by the Americans not only to ensure peace but also to establish democracy in the defeated countries. This occupation became a permanent feature in the second half of the century, ensuring bases for the victor on every continent.

### The foundations of power

The *pax Americana* rested on two pillars; one was political, based on the United Nations and its specialized agencies, the other was economic and included such institutions as the International Monetary Fund (IMF) and the World Bank.

The idea of correcting the weaknesses of the League of Nations by replacing it with an international organization like the United Nations, appeared in the Atlantic Charter and took its final form in August 1944, at the conferences at Dumbarton Oaks and, following Roosevelt's death, San Francisco. In between, the idea had been approved by the Big Three at Yalta. The UN's structure and distribution of powers reflects the influence of the American Constitution, with an executive represented by the Security Council (11 members, five of them permanent, the United States, the USSR, the United Kingdom, China and France), a legislature in the shape of a general assembly where representatives of all the member states sit, and a judiciary in the form of the International Court of Justice. It was symbolic of the new international order that New York was made the permanent home of the United Nations Secretariat.

It also fell to the United States to prevent the return of the economic disorder of the inter-war period. The international conference at Bretton Woods (July 1944) decided to set up an international monetary system, based in fact on the dollar, which replaced both the gold standard and the gold specie standard. This choice amounted to acknowledging the economic supremacy of the United States, the main holder of gold in the world. To promote monetary stability, the International Monetary Fund and its right arm, the World Bank, were established, both with their headquarters in Washington, in the capital of their main 'shareholder', the United States. At the same time the foundations of an international trade organization were laid to promote the gradual liberalization of trade, with GATT (General Agreement on Tariffs and Trade) and its 'rounds' (Dillon Round, Kennedy Round, Tokyo Round, Uruguay Round, etc.). GATT has now been succeeded by the WTO (World Trade Organization).

For the time being, people were preoccupied by the perils of a reconversion that proved to be more difficult than the one that had followed the Great War. Over 12 million GIs (for 'General Issue') had to be reintegrated into civilian life, all of whom wanted to get home as soon as possible. Things had been changing: thanks to full employment, savings had accumulated out of money that could not be spent because of rationing and strict measures in support of the war effort, whereas now, with the return of peace, demand was expanding and stimulating the economy. Finally, in 1944, a significant gesture had transformed the Office of War Production into the Office of Mobilization and Reconversion. And above all, in the eyes of its leaders, possession of the atomic bomb ensured such a degree of security that it made possible a speedy return to normal life.

### Towards peace

Demobilization was hastened by the fact that mutinies had broken out in Germany and the Philippines. Within a year, the overall armed forces fell from 14.5 to 1.7 million, and, in the army alone, from 8 to 1 million. Return to civilian life was assisted by long-term generous initiatives such as the GI Bill of Rights in 1944, which enabled veterans to study at university and obtain loans to purchase a house or farm. Tens of thousands of veterans were thus able to enter higher education and contribute to the democratization of society.

Economic reconversion was based both on needs and demands that had been put on the back burner during the war. The end of price and wage controls triggered a race between the immediate raising of the former and the rather slower raising of the latter, with waves of strikes in sectors such as oil, motor car manufacture, steel and mining. The effects of the New Deal's social policies were reflected in unprecedented levels of unionization, the number of trade unionists having risen by 65 per cent during the war. Taking advantage of the economic situation, labour organizer Walter Reuther unleashed his United Automobile Workers into the fray, followed by John Lewis and his miners, who stopped work for two months, and finally by railway workers who in the end gave way to the threat of a federal take-over. This violent social explosion upset public opinion, which reacted by sending a Republican majority to Congress in 1946, by adopting drastic measures to put an end to a situation deemed intolerable, and by regulating the right to strike and banning common practices such as the closed shop. Some saw this as an attack on the welfare state.

Meanwhile President Truman openly proclaimed himself faithful to the tradition of his predecessor, by launching his own reform programme called the Fair Deal, which he summed up in these words: 'Every segment of our population and every individual has a right to expect from our government a fair deal'. A minor, although the most promising, aspect of this policy was a new attitude towards minorities, African Americans in particular. A Committee on Civil Rights, appointed by the president, drew up a report entitled 'To secure these rights', which, without going so far as to make concrete proposals, recommended greater protection of individuals by eliminating racial discrimination.

On 26 July 1948 the president took advantage of these recommendations to issue Executive Order 9981, marking an unexpected switch in racial policy by putting an end to segregation in the armed forces. Despite General Bradley's warning that 'The Army is not out to make any social reforms. The Army will not put men of different races in the same companies. It will change that policy when the nation as a whole changes it', only the Marines resisted. In the end, amalgamation was gradually achieved, facilitated by the integration of combat units and operations in Korea, a historic 'first' for the United States.

### Beginnings of the Cold War

However, post-war feelings of victory were quickly undermined by the fear aroused by the USSR's intransigence. As early as 1946, Churchill had sounded the alarm in his Fulton speech, declaring that an 'iron curtain' had come down across Europe. The Americans watched powerless as the Soviets strengthened their grip on the states of eastern Europe, the last to fall being Czechoslovakia in 1948, while in China, despite their diligent effort, they had no choice but to accept the downfall of the government of Chiang Kai Shek in the face of the successes of the communist Mao Zedong Americans were obsessed by the communist peril.

These external events weighed heavily on the domestic situation. Faced with Soviet expansionism, a great debate raged among the leaders. Progressives, whose spokesman was the former vice-president, Henry Wallace, stressed maintaining relations of trust by seeking an agreement with the USSR at any price. Conservatives advocated *roll-back*, resorting to force, which was bound to heighten tensions in a context that was not very favourable to the United States, but to resort to atomic weapons. Realists advocated containment, according to the line set out by George Kennan in an article in the semi-official journal of *Foreign Affairs* in 1947. This was the path Truman chose: 'I believe it must be the policy of the United States to support free peoples who are resisting attempted subjugation by armed minorities or by outside pressures.' This line, a permanent feature during the Cold War, was followed in both economic and political matters.

Faced with the wretchedness of a Europe under continuous Soviet pressure and the slowness of its reconstruction, the Americans decided to offer direct help. In a still-famous speech delivered at Harvard University's Commencement in 1947, secretary of state George Marshall declared: 'It is logical that the United States should do whatever it is able to do to assist in the return of normal economic health in the world, without which there can be no political stability and no assured peace. Our policy is directed not against any country or doctrine but against hunger, poverty, desperation and chaos. Its purpose should be the revival of a working economy in the world so as to permit the emergence of political and social conditions in which free institutions can exist'. The appeal was addressed to all European states without exception; however, when rejection by the USSR led immediately to rejection by all its satellites, the Marshall Plan was limited to Western Europe alone. This plan, comprising both gifts and loans, also included political clauses and the commitment by the sixteen participating countries to work towards their union.

A defensive agreement among five Western states (Britain, France, Belgium, the Netherlands and Luxembourg) followed in 1948. On the initiative of the United States, this agreement was extended the following year by the North Atlantic Treaty signed in Washington between the five and seven other nations (Italy, Norway, Denmark, Iceland, Portugal, Canada and the United States) creating a defence community, NATO (North Atlantic Treaty Organization), with both a political and a diplomatic structure. The door remained open to other members, such as Germany or Spain. The New World was coming to the help of the Old, as also became apparent in America's preponderant role in mounting with the British Government a 321-day airlift to sustain the people of Berlin when they were cut off from the outside world by Soviet blockade.

Defence and security were henceforth at the heart of the political process. Defence was concentrated in a single secretariat, the Pentagon, which brought together under a single authority the permanent high command of the Joint Chiefs of Staff and all the armed forces. A National Security Council (NSC) was set up within the executive branch, assisted by an external intelligence service, the Central Intelligence Agency (CIA). However, the explosion of the first Soviet bomb in 1949 put an end to the illusion of security, and oriented research, spurred on by the physicist Edward Teller, towards the making of an even more powerful bomb, the hydrogen bomb, which was first tested in 1952.

Even possession of atomic weapons did not guarantee the maintenance of peace. On 23 June 1950, troops of the Democratic People's Republic of Korea invaded their southern neighbour. The Americans reacted rapidly, and, even before the UN intervened, entrusted General MacArthur with command of the troops. This aggression heated up the Cold War and the struggle against communism. Following the switch of China into the Soviet sphere, South Korea was regarded as an essential link, one of the dominos destined to contain the advance of Bolshevism into Southeast Asia.

In fact, the Korean War was a longer and more painful experience than foreseen, marked by unexpected twists and turns: a confused retreat at the beginning, followed by a landing and reconquest, and then an offensive that carried the allied troops to the border with China, before a general fallback to a front which became stabilized for two years south of the 38th parallel. The Korean War came at a time when Americans thought peace assured and the impact on them was all the greater because the losses were heavy (33,000 dead, 100,000 wounded). It also brought down the Democratic administration in the 1952 presidential elections, which paved the way for the Republicans, who were united around the prestigious figure of General Dwight D. Eisenhower, the Supreme Commander of the Allied Expeditionary Forces during the Second World War and architect of the D-Day landings. One of his first moves was to conclude an armistice, which actually took things back to where they had started, since the *status quo* endorsed the partition of Korea into two separate states.

A war for nothing, and in any event an immense disappointment because, despite their military superiority, the Americans had been unable to win. One consequence was a build-up of armaments; there were also agreements drawn up for the establishment of bases in the Mediterranean and the Middle East, as well as for admitting Spain, Germany and Turkey into NATO.

## McCarthyism

But the most worrying effects were internal with the renewal of the 'witch-hunt'. It had all begun in 1947, with the introduction of a 'loyalty oath' for federal officials whose purpose was to exclude everyone suspected of links with so-called subversive organizations. While the purge was very limited, a suspicion persisted that saw agents of the Cominform infiltrated into government departments, the media, trade unions and universities. To what extent had Americans betrayed secrets? Who and where were the guilty ones?

The first targets were progressive filmmakers and producers in Hollywood. Many, like Charlie Chaplin, Joseph Losey and Jules Dassin chose to leave the country. Another favourite target was the State Department, suspected of harbouring or having harboured Bolshevik sympathizers. One of the most brilliant New Dealers, Alger Hiss, who had accompanied Roosevelt to Yalta, was accused of having passed secret information to the Soviets; his past as a member of the Communist Party made him an ideal target. Despite the absence of formal proof, he was condemned, and his case allowed a young Congressman from California, Richard Nixon, to begin a long political career. More troubling was the case of the Rosenbergs, accused in 1950 of atomic espionage on behalf of the Soviets. Of foreign origin and known for their leftist sympathies, they were both condemned to death and executed, despite the *cause célèbre* they aroused in America, and even more in Europe, where petitions were signed and demonstrations organized in their favour. Robert Oppenheimer, one of the fathers of the atomic bomb and former director of the research laboratory at Los Alamos, was accused of harbouring communist sympathies and was systematically excluded from sensitive research. He called for international supervision of atomic energy and eventually refused to be associated with research on the hydrogen bomb.

Joseph McCarthy, the junior Senator from Wisconsin who was elected in 1946, has given his name to a current of intolerance based on exploitation of the credulity of a public ready to see plots everywhere. By ruse and lies, he was able to create a climate of suspicion, without ever producing palpable proof of what he was claiming. Fearing reprisals, the media followed him, broadcasting his hearings in the Senate. Once again, the favoured target was the State Department, accused of having betrayed the country's interests through its most respected members, such as General Marshall, as well as the Democratic Party, which assumed the mantle of Roosevelt, the man of Yalta and cordial relations with Stalin. Libraries were purged of works deemed dangerous, teams scoured cultural centres overseas to censor their activities, and individuals hid documents that might compromise them. Immigration control was strengthened by the requirement to swear never to have belonged to the Communist Party or been a member of a 'subversive organization'. A moral panic descended on the country, without the authorities daring to intervene. In the end, it was McCarthy's own excesses that doomed him: the broadcast, on television, of his Congressional hearings revealed the man's coarseness and the emptiness of his evidence. Censured by the Senate, he later took to the bottle and disappeared into obscurity, leaving behind a sombre heritage of fears and denunciations.

Knock-on effects of this period also affected culture, with producers becoming more cautious in order to avoid becoming targets. A few rare individuals had the courage to stand up to the pervasive conformism, such as Arthur Miller, whose 1953 hit, *The Witches of Salem*, drew its plot from a famous historical episode, a witchcraft trial in seventeenth-century Puritan New England, to denounce the spirit of intolerance that McCarthyism was unleashing. Two years later, *A View from the Bridge* reiterated his rejection of communism, a theme that is also found in Fred Zinnemann's film *High Noon*.

Other issues influenced society. The war in Korea had demonstrated the relevance of desegregation in the armed forces, but it remained deeply entrenched in the country. In 1954, the Supreme Court intervened with a decision of supreme importance. *Brown v. Board of Education of Topeka* reversed the 1896 decision in *Plessy v. Ferguson*, and segregation was declared to be unlawful in public schools, because it was a denial of the equal protection of the laws. Such schools were ordered to 'desegregate' with 'all deliberate speed'. This decision provoked great agitation in the Southern states, which refused to give up an age-old practice of strict racial segregation. In Birmingham, in the heart of Alabama, a Black woman, Rosa Parks, refused to give up her seat in a bus, and thereby set off an irreversible chain of events. Her simple act of defiance brought to the forefront a young minister named Martin Luther King, who was a disciple of Thoreau and Gandhi, and an advocate of non-violence. Three years later the 'Black Revolution' began, sparked by the refusal to admit African American children into a high school in Little Rock, Arkansas, where a violent confrontation between supporters and opponents of desegregation was only ended by the intervention of federal troops.

These disturbances coincided with anxieties awakened by the first successes of the Soviets in space. The launching of *Sputnik*, in 1957, followed a month later by *Sputnik 2*, which carried the first living creature, a dog, highlighted the technological and scientific superiority of the great rival. How had the Soviet Union been able to achieve such an exploit, when Americans were convinced of their own superiority, confirmed by their virtual monopoly of Nobel Prizes in physics? Indeed American scientists had been nominated 19 times in the inter-war period, mainly in physics (nine), in medicine (seven), and also in chemistry (three). In the half-century following the Second World War, they accentuated their virtual monopoly, being nominated 29 times in physics, 37 in medicine, and 27 in chemistry, compared with only three for the USSR. It is only fair to point out that several of the winners came originally from foreign countries and, like many others abroad, had been attracted by the facilities of American universities and laboratories. The US had an obvious advantage in computer-based sciences and had put the emphasis on R&D (Research and Development), while the Soviets had favoured fundamental sciences.

Nevertheless, the Soviets had beaten them into space. This shock set off two reactions. Conscious of shortcomings in their education system (many of the best scholars were foreign-born, as had been shown in the development of the atomic bomb), they decided to use grants and scholarships to encourage the teaching of sciences and foreign languages. Above all, they reacted by creating, under civilian and not military control, a specialized

administration, NASA (National Aeronautics and Space Administration), with broad powers and a large budget, entrusted with the task of developing research on space and laying the groundwork for the launching of rockets. Yet it took many years for the United States to catch up and be the first to land on the Moon.

Fidel Castro's accession to power, following his overthrow of dictator Fulgencio Batista in 1959, represented a different threat, one located just a few kilometres off Florida's coast. Democracy had at first seemed to win out on the island, when the nationalization of oil installations, plus loans from the USSR, precipitated a breach. The new regime became more and more anti-American amid moves to a centrally controlled society on the Soviet model, precipitating the emigration of tens of thousands of refugees to the mainland. The island of Cuba threatened to become a forward base of the Soviets, putting them within easy reach of the North American mainland.

These dark moments should not be allowed to obscure the material advances of Americans during those years of prosperity, when the standard of living was rising steadily as a result of continuous growth that only experienced its first hiccups at the end of the period. The middle class, the backbone of society, emerged from it strengthened and enlarged, borne along by the development of education and tertiary activities (middle- and higher-ranking personnel), at the expense of agriculture and industrial jobs, which faced competition from Japan in advanced technology, and from Third World countries for the primary sector. But this prosperity did not benefit either the poorest, whose proportion stagnated at around 22 per cent, nor the Native American and African American minorities. In reality, opulence masked a more and more unequal society, within which a small, rich minority owned almost half the country's assets, worth more than the whole middle class. Social contrasts were thus accentuated, leaving the fate of the most disadvantaged unanswered.

## THE AGE OF PROTEST

Even in the euphoria of the post-war period, the signs of profound changes affecting both the domestic scene and international relations were already perceptible. The beginnings of the Black Revolution, the discovery of poverty, competition in space with the USSR and Castro's presence in Cuba, all these plunged the United States into a series of upheavals.

Externally, the spectre of communism called for an active policy which, far from being limited to territorial issues, extended to arms control and nuclear proliferation, both threats to the fragile balance between the two great powers. More than ever, the domino theory reigned, in the fear that the fall of one or another of them might make the whole edifice collapse. This fear explains the commitment of the Americans to Viet Nam, the ultimatum to Cuba and the opening of negotiations with the USSR on the control of nuclear weapons.

On the domestic scene, the unleashing of the Black Revolution was premonitory of convulsions which engulfed ethnic minorities and social groups one after the other – African Americans, Native Peoples, Hispanics, homosexuals, students, women, etc. Their demands, onto which was grafted the new treatment of poverty, challenged

the values of American society and were the source of a wave of reforms on a scale reminiscent of and even surpassing the New Deal.

These changes took place in the context created by the return to power of the Democrats in 1961, with the young, brilliant, dynamic President John F. Kennedy, who, surrounded by a team of intellectuals and people of action, launched the New Frontier programme. His inaugural speech recalls that of Roosevelt in 1933: 'The torch has been passed to a new generation of Americans'. He called for a 'grand and global alliance [against] the common enemies of man: tyranny, poverty, disease and war itself … The energy, the faith, the devotion which we bring in this endeavour will light our country and all who serve it, and the glow from that fire can truly light the world. And so, my fellow Americans, ask not what your country can do for you, ask what you can do for your country.' Americans were called upon to act, and to extend their action to the world. A myth was thereby created around the personality of the young president, both because he appeared someone out of the ordinary by his willingness to innovate and because his assassination in Dallas made him the martyr of a tragedy that still remains mysterious. While it cannot be denied that he got the country out of a certain torpor and that he thus imprinted on it the taste for action, his achievements remain rather limited.

The war on poverty and the battle for civil rights encapsulate his commitment. The revelation of poverty in a society of abundance owes much to the impact of the book by Michael Harrington, *The Other America*, published in 1962. There was indeed another America, the America of old people who struggled to survive on their pension, the America of the disinherited, the America of the underdeveloped areas, the America of the minorities, the America revealed by the label 'poverty threshold', below which an American could not live a decent life. But lobbies laid siege to Congress, so that the reforms in the end amounted to limited measures in favour of farmers, old people, regions hit by de-industrialization and education.

### The struggle for civil rights

The American Government responded to the Black Revolution with a determination to fight against racial segregation by guaranteeing civil rights to minorities. The way had been set out by associations such as the NAACP (National Association for the Advancement of Colored People), founded in 1909, and CORE (Congress of Racial Equality), founded in Chicago in 1942 to promote the integration of Black Americans attracted by the labour shortage. The first upheavals of the 1950s refined the forms of non-violent action, which ranged from boycotts to sit-ins, such as when African American students insisted on sitting at a Whites-only counter. This precedent was quickly taken up all over the South, where segregation continued to be in force in public establishments, in particular in restaurants. The freedom rides followed, whose chief target was segregation on public transport. Another target was represented by the universities, which remained one of the most tenacious bastions of segregation in the South. The number of incidents rose, forcing many to be admitted under police guard or to give up in the face of such a hostile reception.

The civil rights movement culminated in 1963 with the celebration of the centenary of Lincoln's Proclamation for the Emancipation of Slaves. Following violent incidents in Birmingham, in the heart of the Deep South, some 250,000 people gathered in Washington on 28 August to demonstrate their support for civil rights. Martin Luther King, one of the organizers, gave his most moving speech: 'I have a dream that one day this nation will rise up and live up to the true meaning of its creed: "We hold these truths to be self-evident: that all men are created equal". I have a dream that one day on the red hills of Georgia the sons of former slaves and the sons of former slave owners will be able to sit down together at the table of brotherhood ... I have a dream that my four little children will one day live in a nation where they will not be judged by the colour of their skin but by the content of their character. I have a dream today ... Black men and White men, Jews and Gentiles, Protestants and Catholics, will be able to join hands and sing in the words of the old Black spiritual, "Free at last! Thank God Almighty, we are free at last"'! This prophetic vision electrified the crowd and earned the organizers a reception at the White House. The non-violence movement was then at its peak, as was the popularity of Martin Luther King. But the aftermath was disappointing, as there was no immediate advance. Confrontations, far from being limited to the South, became more numerous, all over the country. African Americans saw no improvement in their everyday lot, indeed quite the reverse, as a hardening was apparent on both sides, and demands grew louder. In those hot summers, it was the turn of the ghettos in the North to burn: Harlem in 1964, the following year Los Angeles and Chicago, Newark (New Jersey) in 1967 and above all Detroit, under martial law for several days, and then again Chicago in 1968, during the Democratic Party convention.

The rising numbers of violent outbreaks reflected the radicalization of the Black Revolution. The assassination of Martin Luther King in Memphis in 1968 marked the turning point. The slogans changed, the rallying call now being 'Black Power' and 'Black is beautiful'. The movement hardened under the influence of Marxist ideas, which attributed all the misfortunes of the Black minority to the evils of capitalism. In California, the Black Panthers emerged in 1966, with Stokely Carmichael and Huey Long advocating violent struggle and separatism. For their part, the Black Muslims defended a strictly community line, which would consist in making Blacks a Muslim nation within the Union. It was from their ranks that emerged one Malcolm X, the only charismatic leader who might have succeeded Martin Luther King, but he too was murdered.

Although high up in Kennedy's New Frontier programme, equal rights met stiff resistance in Congress, and it fell to Lyndon Johnson, the promoter of the Great Society, to get them passed into law. Under President Johnson segregation was outlawed in public places and employers were required to give equal treatment to all workers. All discrimination in the exercise of the right to vote was abolished, and it was placed under federal supervision. In practice, however, two difficulties arose. The first related to admission to schools, where discrimination continued to be applied illegally. Numerous conflicts, often violent, broke out in the North as well as the South, with parents feeling that the admission of minorities lowered the standards of education. The second had to do with Southern Whites' monopoly over elections, thanks to their control of voting rolls. There too, repeated conflicts often accompanied freedom rides aimed to guarantee Blacks the right to vote.

In the end the Black Revolution ran out of steam, revealing the diversity of African American society. A middle class had come into being, made up of public servants, shopkeepers, professionals or businessmen, who dissociated themselves from violence and excesses to move closer to the White majority. At the bottom of the social ladder, the most disadvantaged groups saw their lot worsen, because of unemployment, illiteracy (the ill effects of dropping out of school) and the breakdown of the family unit (single-parent families are proportionally more numerous among Blacks). Despite every effort, the ghettos, far from disappearing, remained at the centre of many social problems, and even criminal networks.

## Other protests

Black Power found an echo in the Red Power of the Native Peoples who fuelled another protest. This forgotten minority, some living on reservations mostly situated in remote areas of the West, but others in cities, had been all but exterminated. During the twentieth century, their numbers underwent a striking revival: from 300,000 in 1900, they grew to 3 million a century later. In 1924, the Indian Citizenship Act gave Native Americans American citizenship and the right to vote. However, they remained marginalized, being placed under the tutelage of the Bureau of Indian Affairs (BIA), notorious for its corruption and inefficiency. In the early 1950s, the government inaugurated a new policy, of so-called 'termination', granting the tribes wide autonomy, which was difficult for them to take on because of their lack of preparation and shortage of money. The second half of the century saw a renaissance of Indian culture, which the cinema provides the best approach to: from being a foe or a victim, the Indian became a hero, even a model. At the same time, protests mounted, which gave rise to spectacular actions, such as the occupation of the islet of Alcatraz in San Francisco Bay, in 1969, of the BIA, in Washington, in 1972, and the siege of Wounded Knee, the high point of Indian resistance, in 1973. This movement, inspired by the works of Vine Deloria and Dee Brown, expressed itself through the AIM (American Indian Movement), founded in 1970, which called for the return of confiscated lands to the Indians. There were increasing numbers of court proceedings, with a number of successes, as in Maine and California. Indian society was becoming more diverse, the most enterprising going into business, especially oil and operating casinos on their own land, while the vast majority continued to eke out a living in poverty and idleness.

Mexican Americans (or Chicanos) too began to protest, especially in the southwestern states, from Texas to California. The rapid development of this area, due to both industry (oil and derivatives) and plantations, attracted labour across a very porous border. Farm workers found a leader in Cesar Chavez, who, between 1964 and 1969, denounced working conditions for agricultural labourers, organized strikes and secured the support of consumers in a boycott of fruit and vegetables from California. The Chicanos' protest underlined the inexorable rise of Spanish-speakers, whose main demand focused on the place of language in education.

Women too played an active role in this wave of protest. They had won the right to vote in federal elections in 1920, but it was not always the same in states and municipalities. They continued to be little represented in active life, whether in politics (among the few exceptions, at the higher level, were Frances Perkins, Labour Secretary from 1933 to 1945, and Eleanor Roosevelt, the First Lady, who acted as such during and after the mandate of her husband), or in business. In the middle class, they were much more involved in clubs and church activities or spent their time managing the household. After the war, where they had played a prominent role in the economy, they lost their jobs and were sent back to their kitchens and babies, victims of their lack of qualification. They complained also of the discrimination they met with in professional life, as well as of their legal inferiority. Things began to change in the 1960s when they entered in colleges and universities in great numbers and obtained degrees qualifying them for active professional lives in medicine or law, research, university teaching, or business. At the same time, the availability of a contraceptive pill made it easier for women to juggle their personal and professional lives. As a consequence, the age of marriage and first pregnancy was gradually postponed, allowing women to get better jobs, higher salaries and extended independence.

Their frustrations were expressed in a pamphlet by Betty Friedan, which appeared in 1963, *The Feminine Mystique*, followed by the creation of NOW (National Organization for Women), whose rallying-cry was: 'to take action to bring women into full participation in the mainstream of American society now.' This was followed by marches, often noisy and colourful, to demand full equality of rights, along with gestures such as 'bra-burning' and the public rejection of underwear, as a symbol of male domination.

The feminist protest met with relative success. More women entered professional life and they gradually rose to responsible positions as lawyers, doctors, academics or executives. One of their key demands, the right to abortion, was won in 1973, by the decision in *Roe v. Wade*. But this aroused anger in religious and conservative circles, which regarded abortion as a crime and organized punitive attacks on clinics and doctors involved in terminating pregnancies. Since then, the issue of abortion has continued to divide American society. On the other hand, although adopted by Congress in 1972, the Twenty-seventh Amendment granting equal rights (ERA, Equal Rights Amendment) failed in 1982 due to lack of ratification by the states before the deadline, with opposition coming chiefly from the more conservative South. In a country that sees itself as the showcase of democracy, women are still not equal to men. A strong sign, however, is their presence in non-combatant units of the army, where in 1980 they accounted for almost 10 per cent of total numbers and by 2003 had risen to nearly 20 per cent.

The cause of defending racial minorities mobilized a section of youth, especially in colleges, and led to serious agitation in some of the most prestigious campuses. Previously confined within the calm of campuses often cut off from the outside world, the new generation, that of the post-war baby boom, reacted against this conformism and found a response in the counter-culture, which drew on both the ideology of the New Left and ideas derived from the Freudian tradition

The New Left grew from the encounter between progressivism and Marxism, as represented in such works

as C. Wright Mill's *Letter to the New Left*, or Paul Goodman's *Growing Up Absurd*. By advocating rejection of the consumer society and of middle-class values, the cult of individualism and the promotion of minorities, in short the right to be different, it linked up with the philosophical line of thought distantly derived from Freud, but in fact owing more to the interpretation given in Herbert Marcuse's *Eros and Civilization* (1956), a book more often cited than read. What the youth of the time got from it was the cult of the body to attain true happiness, at the price of using soft drugs such as marijuana, or even hallucinogenics, such as LSD, and the rejection of all sexual taboos. Many young people were attracted to communal living, preferably far away from any form of civilization, as well as in urban pockets such as Greenwich Village in New York, Venice West in Los Angeles or Haight-Ashbury in San Francisco.

The university protest movement took shape in a movement called the SDS (Students for a Democratic Society), founded in 1960 by two former students of the University of Michigan, Al Haber and Tom Hayden. Hayden was the author of the platform known as the Port Huron Statement, from the name of the city where it was drafted. Its base was participatory democracy, in other words intervention by students in the running of universities. The SDS was very active and noisy on campuses, even if it only won the support of a minority, and took advantage of the popularity of the counter-culture to attack the university hierarchy. But its favourite target was the ROTC (Reserve Officers Training Corps), accused of training personnel for the Viet Nam War. Between 1965 and 1970 there were violent clashes, in California, Michigan, Wisconsin, Harvard, and Columbia (New York City), where the police attacked a building that had been occupied by students, and finally at Kent State (Ohio), where four students were killed in a clash. The centre of protest continued to be in California, because of its proximity to the ports where troops embarked for Viet Nam. This revolt of university youth had lasting consequences that included greater mixing of the sexes, an opening to minorities, the creation of ethnic studies programmes and, more generally, a new stage in the democratization of education.

The demands of minorities found a partial response in the Great Society: in addition to the protection of civil and voting rights, there was social protection for old people (Medicare) and poor people (Medicaid) and the creation of an Equal Employment Opportunity Commission to combat discrimination in employment, not only on the basis of race (African Americans, Indians, Hispanics, Asians), but also of sex (women), giving them equal access to all jobs (public works, minority-owned businesses) and education. It paved the way to a new concept, that of affirmative action, which gave preference to minorities for jobs and admission to universities. This was not deemed contrary to the spirit of the Constitution, given that there were no rigid quotas of admission. Along the same lines, busing was designed to enable disadvantaged children to pursue their education in better schools, even if they were further from their homes. Such were the means to promote racial equality in a society based on a tradition of prejudices.

The Supreme Court upheld the validity of this new course in a famous decision of 1978 (*Bakke vs University of California*), concerning a 'reverse discrimination' case in which a less-qualified minority applicant was admitted to

medical school at the expense of a more qualified White applicant.

Reformist ambitions and the spirit of protest quickly ran up against international realities. Already, in 1961, Kennedy had found himself caught up in the Cuban quagmire after the failure of the Bay of Pigs landing. The following year, the installation of Soviet missiles on the island provoked a serious crisis that almost degenerated into war between the two superpowers. But the decisive game was played out in Viet Nam.

## The Vietnam War

As faithful adepts of the domino theory, the United States had replaced the French in this sensitive area, threatened by communist expansionism. 'I shall not be the president who sees South Viet Nam take the same route as China', once declared Lyndon Johnson. In the early 1960s, the Americans had sent military advisers to help the South Viet Namese set up an army, when a series of incidents drew them into a new phase of containing Vietcong infiltration. Caught up in a vicious circle, they found themselves dragged in deeper and deeper, as the numbers of their troops there rose from 185,000 in 1965 to 536,000 in 1968, on the grounds that they had to face up to the communist threat coming from the north. Despite direct participation in operations on the ground, massive bombardments of cities, the use of defoliants in the jungle to cut off the Ho Chi Minh trail, along which communist forces were infiltrating into the south, the American strategy of massive attack proved ineffective against the adversary's guerrilla war, which inflicted heavy losses (almost 50,000 dead and 300,000 wounded). Public opinion reacted with a wave of massive, violent demonstrations, which brought together, in a single movement, protesters and pacifists, hampering the departure of troops and the loading of equipment in the ports in the West. Once elected president, Richard Nixon opted for a new line, 'Vietnamization', the transfer of responsibilities to the South Viet Namese Government. The American presence fell from 475,000 men in 1969 to 23,500 in 1972, the year that saw the effective end of fighting.

Negotiations, opened in Paris as early as 1968, proved especially delicate for the Americans as they had no cards to play to secure an honourable way out. In May 1972, secretary of state Henry Kissinger announced that peace was at last within reach, but it was only at the beginning of 1973 that an agreement was signed, practically on the basis of the status quo, since it confirmed the continued division of Viet Nam into two states. The agreement was illusory: two years later, the fragile Republic of South Viet Nam collapsed.

The Viet Nam War left an enduring mark on the United States as it was the country's first defeat (apart from the War of 1812). It suffered an unprecedented humiliation that undermined its credit in the eyes of its allies, destroyed the national consensus and confidence in institutions and humiliated the Democratic Party, held responsible for the disaster. The effects were no less harmful economically: for the first time since the New Deal, the dollar, the international monetary standard, had to be devalued by some 25 per cent, throwing into question the whole Bretton Woods system. From now on, the world moved in a system of floating exchange rates that, when combined with repeated oil shocks, led to economic instability and unemployment.

## Watergate

A domestic crisis emerged on top of the international malaise. After President Richard Nixon had been triumphantly re-elected in 1972, he was soon caught up in the Watergate scandal, an unprecedented electoral spying affair at the expense of the Democrats. This affair, which for two years poisoned all political life, became public knowledge thanks to the persistence of several stubborn and curious journalists. Although the president used repeated delaying tactics, the crisis threatened to lead to his impeachment. Rather than face that risk, he decided to resign on 8 August 1974.

That marked the end of a constitutional crisis unprecedented in American history. Presidents had died in office (Harding in 1923, Roosevelt in 1945), others had been assassinated (Lincoln, McKinley, Kennedy), only one (Andrew Johnson) had actually had to face (successfully) trial by impeachment, but none had yet voluntarily resigned to escape prosecution, which was moreover immediately halted by the general pardon granted by his successor, Gerald Ford. This resignation put an end to half a century of 'imperial presidency' or 'presidential republic'. In the future, Congress would take its revenge by strengthening its control and thereby re-establishing the balance, intended by the Constitution, between the legislative and executive branches. Institutions had indeed held up well, but American confidence was profoundly shaken by this long series of tribulations.

Politically, there was a new ball game. The Roosevelt coalition, based on an alliance among Democrats, minorities and progressives, had fallen apart. While up until then, the Democratic Party had had a rock-solid base in the South, which held the Republican Party – the party of Lincoln, the party of abolitionism – responsible for its misfortunes, it now lost this support. The South joined the Republican Party, victorious in the elections at the end of the century in many Southern states, such as Texas or Florida.

But these agitated years were crowned by one major achievement: 'we walked on the Moon'. Galvanized by the initial successes of the Soviets, Kennedy had given a sharp new push to the space programme. NASA devoted us$24 billion to it, employing 300,000 technicians, a project far bigger than the Manhattan Project. There were three successive programmes, Mercury from 1961 to 1964, then Gemini, and finally Apollo, designed to put a man on the Moon. On 16 July 1969, flight *Apollo XI* took off from Cape Kennedy, in Florida, with a Saturn V rocket that carried three astronauts – Neil Armstrong, Michael Collins and Edwin 'Buzz' Aldrin – in a Columbia capsule, along with their lunar module, which separated as the satellite approached to land on the Sea of Tranquillity on 20 July. This exploit, watched by hundreds of thousands of television viewers, unleashed enthusiasm and seemed to inaugurate a new era for humanity, the age of space travel.

In the following years, six more flights were sent to the Moon, and Americans began to coordinate their experiments with those of the Soviets. Thus, in 1975, two rockets, the American Apollo and the Soviet Soyuz, rendezvoused in space by docking with each other, and

then going on to resume their orbit and land separately. For scientists, the results were very rewarding, but these operations were costly and interest in them eventually declined. NASA set itself to studying other technologies, such as orbital stations to serve as platforms for the study of space and reusable shuttles, *Orbiter – Challenger, Discovery, Atlantis* and *Columbia* – which were used to make trips to and from Earth. These tools proved to be very effective, but dangerous, and following the explosion of the *Challenger* shuttle with its crew and because of the high costs of the operations, the space programme was severely cut back. Essentially, only its military aspects continued, and that meant that control of space became a strategic objective, as essential for the future of the United States as control of the seas.

### Fin de siècle

The last two decades of the century saw America faced with a new series of challenges, with alternating successes and setbacks. Americans recovered their confidence with the upbeat presidency of Ronald Reagan and the fall of the Soviet regime. The Cold War was soon no more than a memory and, according to university professor Francis Fukuyama, 'the end of history' was in sight. But was this not simply a deceptive illusion?

The absence of a major economic crisis stimulated technological progress and its practical applications. The country did suffer recessions, the most serious one being in 1982–84, but it was immediately followed by the longest and most sustained period of expansion ever seen. The number of jobs more than doubled, consumption exploded, and the population kept on growing. Innovation played a major role in this boom period. A new industry, the space industry, was born, a field in which the United States reigned supreme. As with the application of nuclear power for electricity production and the use of jet engines in civil aviation, so once again it was defence research that led to civilian applications. But unlike in the USSR, technical progress was put in the service of the consumer.

The most promising innovation was informatics, the first achievements of which date back to mid-century. In the 1960s, assembly line production began, and then, in the 1980s, came personal computers (PCs), which made the computer an indispensable item of equipment in all American homes. Finally, the creation of the Internet totally transformed the world of communication at the expense of the printed word and social relations. Informatics became the engine of the American economy, as electricity and the motor car had been in the 1920s, Silicon Valley and Route 128 supplanted Detroit, and Microsoft, General Electric. The computer became as much a necessity as the motor car, and the Internet as the telephone. A whole industrial sector developed, accompanied by its inevitable subcontracting, which attracted many young dynamic entrepreneurs into software, whose advances ensured the good health of the market. The wave of optimism was such that serious minds went so far as to predict, somewhat prematurely, the end of economic cycles and crises. The financial markets took off, to the greater profit of the golden boys and traders who fuelled the speculative bull market and nurtured the illusion of endless expansion. Quick fortunes were unmade as fast as they had been made. It was

in this 'new economy' based on informatics that the wealth and risk inherent in innovation were concentrated.

American economic supremacy was based on a vigorous commercial policy deliberately focused on trade liberalization, using the World Trade Organization, where the United States found itself in conflict with both Europe and developing countries. At the same time, it was promoting a unified continental market: in 1988, after long negotiations with Canada, an agreement provided for the gradual elimination of tariff barriers between the two countries, which was later extended to the whole North American continent, by the adhesion of Mexico (NAFTA, North American Free Trade Agreement) and with the hope of a rapprochement with the countries of Latin America, some of which were already associated in Mercosur.

Politically, Democrats and Republicans alternated in power, to the advantage of the latter. Among both liberals and conservatives, the welfare state was more and more criticized, in the name of freedom of enterprise and a return to the country's traditional values. It was criticized for being costly, for burdening the budget with useless expense, for hampering individual initiative and for distorting the market economy.

Political parties were losing their influence over citizens, as shown by the steady decline in voter participation in elections. The South became a Republican stronghold, minorities other than African Americans swung between Democrats and Republicans, and options in foreign policy (Israel, the Middle East, etc.) led to swings. The age of protest was over, and new schools of thought had emerged.

The liberal tradition, hitherto all-pervasive in its many variants, and the New Left of the 1960s were overtaken by the rise of neo-conservatism, which took shape in a New Right. This marked more than the arrival of a new generation, it also represented the convergence of a religious revival and a return to the sources. Revivals, a recurrent feature of the American past, met with new fervour, Jerry Falwell replacing Billy Graham before attentive and enthusiastic crowds, whose image was now picked up by television and the electronic church. The favourite targets were divorce, and, in the fashion of the times, homosexuals, abortion and prayer in public schools. This new right drew on the think tanks, of which there were more and more, such as the Brookings Institution, and spread the ideas of Irving Kristol, Norman Podhoretz and Michael Novak on society and the economy. State control, which only served the new class (intellectuals, bureaucrats, functionaries, etc.), must be pruned back in favour of individual energies. Economic thought was renewed by the supply theory: contrary to ideas common since Adam Smith, it is not demand that generates growth but supply. Therefore the consumer must be freed from the burdens put on him, especially taxation, and, to achieve that, state expenditures must be cut back. This represented the repudiation of Keynesianism, and its origin lay in California, where a referendum had successfully put a ceiling on property taxes. In the future, benefits would go, not to the disadvantaged, but to the classes that generated prosperity.

A new approach, deregulation, was thus launched during the presidency of Jimmy Carter, a Democrat, in transport and banking. Air transport was the first to be 'deregulated', and perverse effects were at once apparent, with the closing of the least-profitable routes. The price war certainly benefited consumers, and promoted the rise of low-cost companies, at

the expense of traditional companies, some of the most prestigious of which collapsed in the storm. The sole exception to this deregulation was rail transport, permanently in the red, which was partly reorganized in a covert nationalization, which took a hybrid form in Amtrak. In banking, the distinction, introduced at the time of the New Deal, between deposit banks and commercial banks was abolished, which led to reorganization of this whole sector and bank mergers. Deregulation also put an end to the monopoly of American Telephone and Telegraph (AT&T), thereby totally transforming the telecommunications sector.

The main standing divergence between the two parties was over the extension of medical coverage, regarded as one of the means of fighting poverty. Part of the Great Society programme of Lyndon Johnson was taken up by the two Democratic presidents, Carter and above all Clinton, who fought, vainly, for a further extension and failed in the face of Congressional procrastination and obstruction by the powerful lobby of the American Medical Association.

Ronald Reagan associated his presidency with 'Reaganomics', a policy that consisted in simplifying the tax system and reducing direct taxes for the well-off, by cutting social expenditures and handling responsibility for it over to the states. This was followed by a sharp economic revival, a reduction in unemployment, which fell from a peak of 10 per cent in 1982 to 6 per cent in 1987, a growth rate as high as 3 per cent and the creation of hundreds of thousands of jobs. Reagan was thus credited with the success of a neo-liberal policy, which however excluded the agricultural sector, supported by massive subsidies. One fly in the ointment was the worsening of the trade deficit, which became a permanent feature after 1986 because of a massive rise in imports of manufactured goods, but this deficit was made up by the issue of Treasury bonds, made attractive by the exchange rate of the dollar, which had once again become the dominant currency sought after worldwide.

## From melting pot to salad bowl

Beyond these everyday ups and downs, the recent evolution of American society gives ground for puzzlement, insofar as the melting pot has been relegated to the rank of a myth of another age to be replaced by a new vision, popularly known as the salad bowl, diversity and multiculturalism at the expense of fusion.

In a book published in 1991, the historian Arthur M. Schlesinger, Jr. deplored this *Disuniting of America*, criticizing the moral cowardice of 'a strident multiculturalism' and the way American schools had abandoned their mission of educating a nation. According to him, multiculturalism threatens the very future of democracy because of lack of knowledge of the past and rejection of traditional values. Another historian, David Hollinger, in *Postethnic America: Beyond Multiculturalism* (1995), presents American society as an 'ethno-racial pentagon', with five segments: Indians, Euro-Americans, African Americans, Asian Americans and Latinos. Thus he was taking up, in a slightly different form, the categories of the 1990 census, in which Americans were asked to specify the 'race' to which they belonged, which is a clear indication that this notion was officially recognized. The 2000 census went even further, adding a sixth race, that of Hawaiians, and introducing a new category, that of more than one ethnic origin, as more than 7 million Americans

claim a double origin. Even though that represents barely 3 per cent of the population, the response is still significant of the trend towards laying claim to one's difference.

The debate over multiculturalism has been recently reactivated by Samuel P. Huntington, when speaking to 'the clash of civilizations', in the world as well as in the US. For him, the main threat in this country is the rise of the Hispanic community, which has recently out-numbered the African American (40 versus 36 million). As Hispanics possess a specific culture and speak a different language, Huntington fears for the unity of the country, as he states: 'Will the United States remain a country with a single national language and a core Anglo-Protestant culture? By ignoring this question, Americans acquiesce to their eventual transformation into two peoples with two cultures (Anglo and Hispanic) and two languages (English and Spanish)'. And yet, the trend shows that Hispanics assimilate as quickly as other minorities and that the second generation speaks English rather than Spanish.

Indeed, this debate is not new. The motto *E Pluribus Unum*, which originally symbolized unity in diversity, is now being given a new interpretation, the origins of which can be traced back to the German-American philosopher Horace M. Kallen, who had discussed this particular feature of American society as early as 1924 in his book *Culture and Democracy in the United States: Studies in the Group Psychology of the American Peoples*. In the xenophobic context of the time (rise of nativism, revival of the Ku Klux Klan, restrictive immigration laws) he was already speaking of American peoples, defending the idea of a 'cultural pluralism'. Kallen's aim was to defend immigrant communities, referring to the Declaration of Independence, which proclaimed the equality of all beings, including those who belonged to a different culture, like Blacks or Native Peoples. The notions of double allegiance and multiculturalism are thus already implicit in his analysis, even if they are not officially acknowledged. American society has shifted from the melting pot to the salad bowl. This theme of basic ethnic differences reappeared at several times, especially in the turmoil of the 1960s, and was taken over by various observers, among them Michael Novak, whose *The Rise of Unmeltable Ethnics* (1971) became a best-seller as well as a symbol.

By the end of the century, American society had changed, under the impact of the diversification of immigrants, the push of ethnic or identity demands and the rise of individualism. Anglo-Saxon cultures, which used to serve as mould and reference, is now faced with other successful cultures, African American culture, which has enabled Blacks to recover their pride, or that of Mexican Americans, who assert their singularity above all through their language. More generally, the children of European immigrants, be they Irish, Italian, Greek, Russian, Jewish or other, remain faithful to their own cultural traditions. Finally, the recent immigration of Asians, Viet Namese, Cambodians, Hong Kongers etc. has introduced a new variant into this cultural kaleidoscope. The Fourth of July continues of course to be celebrated as the national festival, but it does not rule out either St Patrick's Day, especially in Chicago, where the river is coloured green in honour of green Erin, or the Chinese New Year in the Chinatowns, or the *Cinco de Mayo* for Mexican Americans, or Columbus Day for Italian Americans, or, more recently, Martin Luther King Day for African Americans.

For years, recognition of multiculturalism was aided by affirmative action, which made it possible to better integrate representatives of minorities into society. It is true that eventually a reaction began to be felt in sensitive states such as California and Texas. But even if its application there has disappeared legally, affirmative action has become a habit, especially in the selection of students and even more in businesses, which have made enormous efforts to diversify their workforce. American society has moved to the stage of multiculturalism, as witnesses the pride in being a hyphenated American.

## The end of the Cold War

Events in the outside world have rather blurred this evolution. When he came to power, Reagan had to erase the humiliation that Americans had just suffered in Iran, where, after the fall of the shah, in 1979, Islamic militants had invaded the American embassy, holding its occupants hostage for several months. After Carter's fiasco in his attempt to secure their freedom, the last of them left Tehran only as the new president took office.

But what Reagan inherited was not by any means all negative. Detente, already initiated under Nixon, had continued under Carter, who had signed the SALT (Strategic Arms Limitation Talks) agreements with the USSR, put an end to the old dispute with the Republic of Panama by handing the Canal Zone over to it on certain conditions, and had got personally involved in the Middle East conflict by sponsoring the Camp David Accords between the Egyptian Sadat and the Israeli Begin. But detente, which seemed finally to be taking root in that sensitive area, was soon called into question by a resurgence of nationalist passions.

Moreover, the USSR's intervention in Afghanistan, in late 1979, had awakened the spectre of Soviet expansion in the rear of the oil-exporting Middle East, unstable as it was and whose main consumers of oil were the Americans. The Cold War seemed to take on a new lease of life, pushing Reagan at once to adopt its style and language, lambasting the 'empire of evil'. In reality, the Republican administration, blinded by decades of Cold War, was so unable to detect the weakening of the Soviet empire that it made no effort at all to take advantage of it. Indeed, quite the reverse, it strengthened its military potential with a massive increase in the defence budget, which ended up higher than during the Viet Nam War. It involved every branch: the navy, which had to confront its Soviet rival in full expansion, the air force, which secured the new bomber it had long been calling for in vain, and the special forces, while Pershing missiles were installed in Europe causing friction within NATO. But the novelty was the launching of a controversial and very expensive project to protect American territory with a nuclear shield, which reignited a ruinous arms race, of questionable effectiveness, and, in the end, fatal to the USSR.

But the coming to power of Gorbachev, and the Reykjavik summit in 1985, relaunched the Soviet-American dialogue. 'It is the beginning of a new relationship', Reagan declared significantly. An agreement was reached on the resumption of talks on limiting conventional and nuclear weapons and renewing cultural relations. When the Soviets left Afghanistan, as the Americans had Viet Nam, Reagan's anti-Sovietism became tempered with realism, the rhetoric of the empire of evil disappeared from his speeches: in 1989, the Berlin Wall came down and the Warsaw Pact was dissolved. This return to detente continued under George Bush, who, in 1991, reached an agreement on arms limitation, and cooperation in space was stepped up.

The collapse of the Soviet empire created a totally novel situation, making the United States the sole superpower in a unipolar world whose security seemed lastingly assured. But that was an illusion, for Iraq's invasion of Kuwait in 1990 challenged the status quo and called forth an immediate reaction from the United States, which, at the head of a coalition empowered by the United Nations, undertook the liberation of Kuwait, while refusing to push as far as Baghdad. The United States was also involved in the long Balkan conflict that followed the disintegration of Yugoslavia; and, as a result of its mediation, a compromise was signed at Dayton. The superpower thus saw itself entrusted with peace missions in various parts of the world, which dragged it willy-nilly into conflicts that were poorly understood by the public. For Americans, the fall of Bolshevism came to mean an increase in interventions that made them into the firemen of the world order.

The persistence of threats led to constantly rising military expenditures at the expense of social ones and the permanent deployment of American troops all over the globe: some 250,000 Americans are permanently stationed in Western Europe, the Balkans, Saudi Arabia, Kuwait, South Korea and Japan, without mentioning the financial aid, for military purposes, given to allies in the Middle East or the war on drugs in Latin America. A virtual American empire has come into being.

And threats of a new kind were emerging from 'rogue states'. Several attacks had already been aimed at American targets abroad: tourists on a cruise in the Mediterranean had been attacked, a bomb had exploded in a Pan Am plane which crashed in Scotland in 1996, a booby-trapped lorry had killed American soldiers in Saudi Arabia in 1998, American embassies in Kenya and the United Republic of Tanzania had been bombed. The source of the evil lay in terrorism, emerging from countries that, for one reason or another, cultivate anti-Americanism.

The United States is now faced with terror on its own soil. In 1994, in New York, a first attack was made on the World Trade Center, a symbol of triumphant capitalism, failing to damage the structure, but causing many casualties. The following year, an explosion destroyed a federal building in Oklahoma City, and again questions were asked as to the motivation for the attack. The sense of insecurity that overtook Americans culminated in the attacks of Tuesday, 11 September 2001, when terrorists hijacked commercial airliners and crashed them into the World Trade Center in New York City. The twin towers collapsed in a cloud of flames and ashes, claiming several thousand lives. Another plane crashed into the Pentagon, setting fire to one of its wings, while a fourth, doubtless intended for the White House, crashed in Pennsylvania. For Americans, it was a declaration of war: they united around their president, George W. Bush, just as they had rallied around Franklin D. Roosevelt after the Japanese attack on Pearl Harbor in 1941. But this time, the enemy was invisible, even though suspicions pointed to small terrorist groups originating from the Middle East, whose mastermind, Osama bin-Laden, was hiding out in Afghanistan. He was immediately

designated as the target for the next American intervention. Did that black Tuesday signify the end of an epoch or the beginning of a new historical era?

Where was the American people at the end of a century that had opened under the twin signs of non-interference in international affairs and the melting pot? Change worldwide propelled the United States, willy-nilly, into a position of responsibility, which it had never sought, to become guardian of one particular international order. As for American society, it has proved de Tocqueville wrong: in his *Democracy in America*, he had deplored the tyranny of the majority. Since then, the minorities have taken their revenge.

## CANADA IN QUEST OF AN IDENTITY

In Canada, the end of the century was overshadowed by upheavals in which the very future of the country was at stake. The nature of Canadian identity was called into question, politically by the 'Quiet Revolution' in Quebec and its impact on federal relations, economically by the country's being so close to the United States, and culturally by the advance of multiculturalism.

### The 'Quiet Revolution' and its aftermath

In Quebec, following the death of Maurice Duplessis in 1959, the electors voted into power, by a small majority, a Liberal government under Jean Lesage, who embarked on a sweeping policy of reforms, the 'Quiet Revolution', as it was labelled by a journalist. This shift was symbolized by a change of vocabulary: henceforth there would be no more talk of 'French Canadians' but of *Québécois*, Quebeckers, and every area was turned upside down by the change.

In terms of administration, a Quebecker state was established by the creation of a bureaucracy recruited not, as hitherto, by the vagaries of patronage, a variant of the American spoils system, but on the basis of competence and merit; the number of ministries was increased and they were made more specialized (including one for external affairs); a bureaucracy was established, and the House of Commons, with its excessively British overtones, was renamed the National Assembly. In the economic sphere, priority was given to the development of natural resources and their exploitation by French-speaking personnel. The creation of Hydro-Québec reflected Quebec's determination to benefit from its vast hydroelectric potential (Manicouagan, James Bay, Great Whale River, etc.) and to become an exporter of electricity. A genuine Quebecker capitalism came into being, with international firms such as Bombardier in aeronautics (de Havilland) and the railways (TGV), or Cascades in paper manufacture. Finally, after the exclusion of the Catholic Church from education, a new educational system was established under the supervision of a ministry of education, which set up junior secondary schools, CEGEPs (Collèges d'Enseignement Général et Professionel), and adopted the California model to set up a network of universities (UQUAM, Université du Québec, in Montreal) covering the whole province. Everywhere the influence of the clergy was in retreat, with places of worship and convents being sold and turned into educational establishments. In just a few years, Quebec lost its conservative face and took a giant leap into modernity.

This shift was rooted in latent nationalist sentiments, sharpened by the flowering of a French-speaking culture, whose attractiveness lay in its novelty, variety and simplicity. Initial popularity came from folk-singers like Félix Leclerc, Robert Charlebois, Gilles Vigneault and Pauline Julie, who made Quebec famous all over the world, novelists like Jacques Godbout, Marie-Claire Blais and Antonine Maillet, who celebrates the epic of the Acadians driven out by the British and returning to their homeland, poets like Gaston Miron, film-makers like Denys Arcand (*Le déclin de l'empire américain*, *The Decline of the American Empire*), painters like Riopelle, dramatists, etc. This flowering restored confidence and pride to French-speakers and fuelled their nationalism.

This nationalism, encouraged by General de Gaulle's resounding 'Vive le Québec libre' in Montreal in 1967, was expressed in several groupings, including the RIN (Rassemblement pour l'Indépendance Nationale), which launched a wave of terrorism in 1970, marked by the kidnapping of a diplomat and the assassination of a minister followed by the declaration of a state of siege in Quebec. There was a confrontation between two emblematic figures, on the one hand René Lévesque, the founder in 1968 of the Parti québécois (PQ), and subsequently its leader, prime minister of the province from 1976 to 1985 and advocate of *sovereignty-association*, an ambiguous formula which implied, depending on the interpretation, independence or autonomy, combined with economic union with Canada; and, on the other, Pierre Elliott Trudeau, leader of the Liberal Party (PL), also a Quebecker, federal prime minister from 1968 to 1984 (with a brief break in 1979–80), and a firm supporter of enlarged federal power, which alone could ensure the country's cohesion in the face of demands from his native province, to which he denied the right to special treatment, which might lead to 'asymmetrical federalism'.

An initial phase of the confrontation was over language use. In 1969, Trudeau had secured the passage of the Official Languages Act, making bilingualism official policy, giving French and English an identical status in public life and in the court proceedings. Canada also agreed to set aside a number of high-level positions for French-speakers, who thus made a much-remarked appearance in the civil service, especially in external affairs. Where French speaking was under-represented, in British Columbia, Manitoba, New Brunswick, the federal government subsidized cultural centres. From then on, Canada was actively engaged in organizing the summits of La Francophonie and followed its work regularly. Quebeckers reacted sharply by making French the sole official language of the province, in public life, education and advertising. Immigrants there were subjected to 'immersion', designed to integrate them better into a French-speaking environment.

In a second phase, Quebec and Canada confronted each other in a debate over the constitution. In his aim of strengthening federal power, Trudeau wanted to 'repatriate' the 1867 British North America Act from London to Ottawa, in order to put an end to colonial status and give the country its own constitution. Quebec opposed this, arguing that this repatriation was an attack on the powers of the provinces. Several inter-provincial conferences were organized, which failed to reach agreement. Finally, repatriation was effected in 1981 and then a new constitution was approved, including a right of amendment, as in the United States, and with a Charter of Rights and Freedoms,

all against Quebec's will: the province found itself then and since in an unprecedented position, still part of the Confederation, although rejecting its constitution.

The last phase, the longest and most confused, centred around the position of Quebec in this Confederation. The PQ, torn between supporters of independence and defenders of sovereignty-association, had organized a first referendum in 1980, which rejected the proposal for association by a majority of 55 per cent. The debate then lay dormant before being taken up in a new referendum fifteen years later, which was also narrowly rejected. Quebeckers thus twice rejected the temptation to venture into the unknown, a reflex that showed both a degree of conservatism in society and the preference of non-French-speakers for the status quo. But the debate was far from over, since, after Trudeau's systematic refusal to acknowledge the specificity of Quebec in a majority English-speaking whole, the malaise persisted.

As soon as it took power in Ottawa, Brian Mulroney's Conservative government (1984–93) endeavoured to escape from this impasse by proposing a compromise, based on the notion of 'distinct society', a formula that had the advantage of preserving political unity while acknowledging the specificity of Quebec. Several inter-provincial conferences discussed it, but the very notion of distinct society was so vague that it was immediately met by hostility from the First Nations, who also asked for a special status. Nevertheless, despite its ambiguity, a platform was cobbled together in the end and submitted for approval to the provinces, which rejected it. One final effort consisted in resorting to a national referendum in 1992, which resulted in another rejection.

## Customs union

The debate on Canada's constitutional future is thus blocked and may well remain so for a long time, since the Liberal government, in power after 1993, has refused to reopen this troublesome dossier. Meanwhile, the nationalist drive in Quebec has waned, Trudeau has retired from politics and none of René Lévesque's successors (he died in 1987) have inherited his charisma. Yet this impassioned debate changed the shape of things, at the expense of the traditional parties, Liberals as well as Conservatives, who lost their credibility in it. The constitutional debate reawakened the old demons pitting East against West, French-speakers against English-speakers, farmers against city-dwellers, centre against periphery. The two-party system was again challenged by the virtual disappearance of the traditional parties in the West. The Social Credit Party there had a distant successor in the NDP (New Democratic Party), led by Ed Broadbent, social-democratic in inspiration, which put down new roots in the Prairies, and even made a short-lived breakthrough in the East, while in British Columbia and Alberta a new grouping made its appearance, Preston Manning's Reform Party, which exploited popular resentment against the centralizing forces of Ottawa and Eastern businessmen, so much so that following the 1993 elections, the Liberal Party found itself the sole national party, and, in a totally unprecedented situation, the official opposition in the House of Commons was represented by a regional party, the Bloc Québécois, the federal counterpart of the provincial PQ.

In the wake of the economic prosperity of the post-war period, growth became more chaotic, with phases of expansion and stagnation, which followed the course of the American business cycle. The devaluation of the US dollar in 1972 had knock-on effects on the Canadian dollar, which cut itself off from it, and the oil crises hit hard, although they did stimulate the exploitation of wells in Alberta. Canada remained closely in step with its neighbour, but a determination emerged to develop a domestic capitalism, with its epicentre now in Toronto. The main beneficiaries of this were telecommunications, as seen in the success of Northern Telecom, the processing of raw materials, with Alcan in aluminium and consumer products associated with cultural productions in the Bronfman empire, built on whisky. Canada took its place among the great economic powers, which earned it admission in 1975 into the very closed circle of the G7, meeting in 1981 near Ottawa.

But Canadian production cannot compete with that of its powerful neighbour. How can a market of only 30 million consumers be compared with one of almost 300 million? Canadian products are expensive, because of the smallness of the domestic market, partly too because of the burden of social insurance contributions unknown to the south. While it brings security, the welfare state has a cost, which is passed on to production. Finally, the economy, even though meeting individual needs plays a growing role, continues to be based largely on the exploitation of raw materials and energy, which involve a degree of complementarity with the United States. The success of the Common Market in Europe provides a precedent and a reference point for what Canadians are seeking, an enlargement of their economic space, while preserving their uniqueness.

Such an idea was not new, since Wilfrid Laurier had already been dreaming of it a century earlier. The paradox is that it was a Conservative government, that of Brian Mulroney, and not a Liberal one, which, after hard bargaining, achieved it in 1988. Business circles had an ambivalent attitude, both wanting an enlargement of the market and fearing competition from their neighbour. For all Canadians, the priority was to maintain their achievements in the area of social security and employment protection. What English-speakers feared most was an invasion by the American media, cinema, music, radio and above all television, with the risk of killing off local production. Among the fiercest opponents too were farmers in the West, who felt disadvantaged vis-à-vis their American counterparts by the higher costs their farms incurred. Paradoxically, French-speaking circles applauded this rapprochement, in which they saw a barrier against 'English-speaking imperialism'. The United States was the leading market for some of their exports, such as electricity and paper pulp.

The agreement, which came into effect in 1989, known as the Free Trade Agreement, envisaged the gradual reduction of customs tariffs between the two countries over a period of ten years and the free movement of persons. Under the name of NAFTA, it was extended to Mexico, meaning the eventual emergence of a common market on the American continent. But it is very different from the Common Market, in that it is limited to trade and involves no common policy or supranational institutions. Canada's sovereignty emerged from this shift unscathed.

## An open society

Like the other industrialized countries, Canada experienced social disturbances, although to a lesser extent than its neighbour. The generation born of the baby boom reacted sharply against the traditionalist society into which it was thrown when it reached adulthood. It drew strength from an unprecedented cultural expansion that completely broke away from its roots, both British and French, while also seeking to free itself from the grip of America. Every area of culture used this renaissance to protest and demand greater openness and more equality.

In the forefront of these protesters were women, who enjoyed the prestige of an exceptional generation of novelists, among them Margaret Atwood, Alice Munro, Mavis Gallant and Margaret Lawrence. Of course, they already had the right to vote, but they were in an inferior position in many areas, especially employment. In 1967, the government convened a Royal Commission on the Status of Women, which delivered its report three years later. Its conclusions concurred with the claims of feminist groups about these discriminatory practices and sexual harassment. Various measures were designed to put an end to them, although their effects would only be felt over the long term. More women were admitted to the public sector, among them Jeanne Sauvé, the first to reach the position of governor-general of Canada, in 1984. Salaries increasingly tended to be more equal, and above all women now occupy a not insignificant position in the world of work.

Trade unionists, very active in some sectors, represented another source of protest. They were fighting to free themselves from both the grip of international unions, at the time dominated by the all-powerful American unions, like the AFL, and, in Quebec, the Catholic Church. A reaction developed, in often violent strikes and confrontations, to 'Canadianize' these organizations, secularize them and make them responsible interlocutors in labour disputes, which continued to be numerous and often bitter.

Protest also came from the 'Indians', known here as 'First Nations'. As in the United States, they made a striking comeback over the century: there are officially 750,000 of them, in addition to 50,000 Inuit in the Far North. Three-quarters of them live on reservations, in wretched conditions, where, for lack of employment, they are plagued by alcohol and drugs. The official attitude, which was one of assimilation, failed, leading to their marginalization in society. There too a change has occurred in recent decades. The spark was the deadly standoff, at Oka, near Montreal, in 1990, between the police and Mohawks, over the appropriation of a sacred wood intended to extend a golf course. Several tribes (known here as bands) claimed land that had been seized from them, like the Cree thrown off their land by the construction works at James Bay, in northern Quebec.

A special case is that of the Inuit, representatives of an ethnic group spread all over the sub-polar zone and more numerous in fact in Siberia. Surviving essentially on fishing and seal hunting, living in igloos, they became well entrenched in the media. Skilful in the game of diplomacy, they were successful in securing recognition of their specific rights and winning autonomy, in 1999, over an area carved out of the Northwest Territories, Nunavut, with its own capital, government and administration, 90 per cent of whose costs are met by the federal government.

Despite the resumption of immigration in the years following the war, Canadian society remained traditional in its foundations, because most newcomers were of European descent. According to the 1961 census, 97 per cent of the inhabitants stated themselves to be of European descent, whereas in 1991, 31 per cent stated that they were of neither British nor French descent. Starting in the 1960s, there was a profound shift in the way immigrants were selected: descent ceased to be the determinant of choice, replaced by professional qualification (skill, complementarity, capital contribution, etc.) or family links (reuniting individuals). In addition, selection was now made before departure, and not on arrival. This meant that the nature of immigrants changed, and the door was wide open for Asians, Viet Namese, Filipinos, Malaysians, Sikhs, as well as other Americans, Haitians, Colombians, etc. The main destination of these new immigrants was the provinces that seemed to them the most attractive, British Columbia, Alberta or Ontario, and urban areas. Thus, in Toronto, almost 40 per cent of the population is made up of immigrants, as against only 20 per cent in Montreal.

In this mosaic, the notion of two founding peoples ceased to have meaning, communitarianism became an integral aspect of the urban scene and the newcomers laid claim to cultural diversity. Canada officially adopted multiculturalism, which has been written into federal legislation since 1971, with its own minister who makes grants to community groups. Recognition of this diversity is regarded as the chief means of maintaining cohesion among cultures that live cheek by jowl but do not mix. Song, theatre and dance troupes thus celebrate Cambodia, Malaysia, the Caribbean or Voodoo.

Following recent upheavals, Canada has been more than ever in quest of an identity that still remains vague. Canadians, including Quebeckers, see themselves above all as North Americans, who have successfully created an original type of society, based on diversity and mutual tolerance. While Canada is still in quest of its identity, it remains the case that, given the pragmatism by all those involved, it has successfully safeguarded and even strengthened its unity, always faithful to its motto, *a mari usque ad mare.*

At the beginning of the twenty-first century, North America is at a crossroads.

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# 33

# SOUTH AND CENTRAL AMERICA AND THE CARIBBEAN

*Gregorio Weinberg,* coordinator

# 33.1

## SOUTH AND CENTRAL AMERICA

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### POLITICAL, SOCIAL AND ECONOMIC PROFILE

Latin America is a vague and too all-embracing term, but it is a useful one, allowing us to distinguish the large landmass within the American continent to the south of the Río Grande (the current border between Mexico and the United States). Throughout the nineteenth century the area to the north of this river embraced capitalism and democracy with determination. However, in the area to the south the so-called 'colonial heritage' lived on. In geographical terms, Latin America is a mosaic of bountiful plains, harsh tablelands, mountain chains broken by pleasant valleys and tropical jungle. It is also a mosaic of different ethnic groups; the indigenous base, already complex enough in itself, offers contingents of black Africans, groups of white colonists, mostly from the Iberian peninsula, although the English, French and Dutch are also represented, as well as the different racial mixes which have taken place and continue to occur. It is also a political mosaic made up of numerous republics of varying sizes, most of which were born at the beginning of the nineteenth century, when the strong link which had hitherto joined them to Spain and Portugal was broken, to be replaced by a more subtle but equally firm link tying them to Britain. Such widespread political independence, achieved so early in the century, is not insignificant, particularly in view of the massive process of global colonization, which characterized the nineteenth century. Encouraged by these relations, the region gradually became immersed in the world of capitalism and imperialism, which reached its peak at the end of the nineteenth century.

It was at this time that the great export economies took shape: cereals, wool and beef on the temperate southern plains, coffee in Brazil, Colombia and Costa Rica, sugar in Cuba and along the Peruvian coast and oil in Venezuela. Capital from the metropolitan centres in Britain, the United States and, to a lesser extent, in Germany and France always played a decisive role. It paid for the construction of the railways and ports, silos and meat packing plants. Its presence was felt in trade and finance. In many cases it even controlled the production process such as the copper mines in Peru or the tin mines in Bolivia, the banana plantations in Central America or the sugar plantations in Cuba. It even helped to shore up feeble states, which were supposed to be responsible for maintaining order.

These enterprises flourished and expanded when trading conditions were favourable but toppled in spectacular fashion when the market failed, as occurred with the nitrate market in Chile and rubber in the Brazilian Amazon. The effects were equally disastrous for the natural environment, and for the labour force, because these activities mobilized vast numbers of workers: Italian immigrants in Argentina and Uruguay, the Spanish in Cuba and the Italians and Japanese in Brazil. In other cases, such as the mines in Peru or the coffee plantations in Guatemala, the workforce was drawn from the ancient indigenous communities, and sometimes vast numbers of black workers were shipped from their bases in the Antilles to work on the banana plantations. Slavery disappeared everywhere at the end of the nineteenth century, but more subtle forms of semi-servile dependency lived on in the stock farms and plantations, and even the recent white immigrants were subject to various forms of coercion. In the large cities, such as Buenos Aires (Argentina), Santiago (Chile) and Mexico

City, a nucleus of organized, militant salaried workers developed, lured by opportunities in the ports and nascent services and industries.

In a cyclical and convulsive manner, destroying perhaps as much as it created, Latin America generated great wealth, most of which remained in the hands of the foreign partners, although a certain proportion was also distributed locally. Wherever wealth was distributed locally, society changed, becoming more broad-based and diversified. The gap between the rejuvenated oligarchies and rural and urban workers was gradually filled by a layer of traders, public employees, small manufacturers and educators, who were called the middle classes.

The more traditional societies were governed by their oligarchies as occurred in Argentina. In Brazil, the oligarchies were duly federated within the old Republic, whereas, in the case of Colombia, they were divided into rival factions, which made civil war a way of life. When the oligarchies were weak, their place was taken by authoritarian and sometimes progressive dictatorships. An example of the latter was Porfirio Díaz in Mexico. However, in the more diversified societies the growing demands of the middle classes and the workers created the right conditions for the political formula prevailing in Europe at the time to be adopted: a broad-based democracy where the will of the people was something more than an agreed fiction. Examples of governments with strong popular support were those of Hipólito Yrigoyen in Argentina (1916–22 and 1928–30), José Batlle y Ordóñez in Uruguay (1903–07 and 1911–15), and Arturo Alessandri in Chile (1920–24 and 1925–32). They all used their power to distribute benefits more widely among different sectors of society, making use of the resources of a state that was on the road to becoming a welfare state.

In Mexico, similar demands joined forces with other more explosive ones. There, as in many other places, the inroads being made by the market economy affected the traditional *campesino* class with its deeply rooted indigenous culture and, above all, its strong links to the land. In Mexico the *campesinos* made their voices heard, and their weapons thundered, turning the original call of those who were merely opposed to Porfirio Díaz's re-election into a vast mobilization of the masses. The revolution began in 1910 and lasted, going through various phases, until it was institutionalized at the end of the 1930s. During these three decades a million people died. On the ruins left behind by the revolutionary storm a state was formed which intervened resolutely in the process of reshaping society. It carried out a far-reaching land reform programme under President Lázaro Cárdenas (1934–40), organized the *campesino* class, turning the *campesinos* into its most staunch supporters, promoted and controlled the trade union movement and drafted modern social legislation. The Mexican government nationalized the oil industry and confronted the United States, but never to the point of breaking off relations. It gave a strong boost to capitalist development both in the countryside and in industry, and promoted mass education. Above all, it established an astoundingly stable political system, which defended law and order with zeal but also jealously guarded its claim to popular legitimacy. It was a kind of exclusive meritocracy where the rules of cooption and widespread corruption were, almost up to the present time, clothed in legitimacy under the guise of the vigorous and jealously cultivated revolutionary tradition.

Three events left their mark on the history of Latin America in the twentieth century. The First World War disrupted its economic relations with the world and provoked internal social, political and ideological conflicts. The 1929 economic crisis dealt a fatal blow to the export economies. As well as bringing prices crashing down and precipitating capital flight, the crisis affected state revenues – practically no state managed to avoid political trauma – but, somewhat surprisingly, it triggered the conditions for a leap forward. With the Second World War, the structure of the new society, already modified by the crisis, grew more distinct and, although the post-war period certainly brought some serious economic problems, such as the supply of raw materials and machinery, it also provided the region with unsuspected opportunities and provoked original political responses.

In contrast to the export economies, the pre-existing industrial sector began to flourish, filling in the gap left by imported consumer goods. The shortage of foreign currency as a result of the crisis, which made imports more difficult, contributed to this development, which took advantage of the equipment already in place, the availability of labour and an eager market turned captive by protectionist policies. State-controlled economic policy, which aimed as far as possible to defend its share of the old export market, was accepted unchallenged. This meant that the domestic market became the new engine for economic growth, and the general profile of society was altered as increased demand for industrial workers led to wage rises which, in turn, fostered an increase in demand. In this way, the expansion of the secondary sector compensated to a certain extent for the crisis in the primary sector. The importance of industrial, mostly urban, workers as a social force began to grow.

The Second World War favoured this process of industrialization, which made remarkable progress, but by the 1950s its limitations were becoming apparent. The equipment was beginning to age, fuel and energy were growing increasingly scarce, and production was too expensive and inefficient to compete in foreign markets. The traditional primary exporting sector bore the brunt of responsibility for generating foreign currency, which was insufficient in any case to cover the costs of industrial growth and the generous salaries upon which the domestic market depended. A solution was sought which involved facilitating investment by foreign companies in order to develop the production of fuels, steel, paper, petrochemicals and more sophisticated consumer goods such as cars, offering the enticement of captive markets protected by strong tariff barriers. There was talk of the need for integrated development. Inspired by Raúl Prebisch, the Economic Commission for Latin America upheld this position. The 'development' trend coincided with the United States' offer to join the effort through the Alliance for Progress propounded by President Kennedy in 1960. The results of this second period of industrial growth were patchy. They were successful in Brazil, where the modern industrial core was consolidated, but failed in neighbouring Argentina.

In general, notable changes took place, but they brought new problems. Full employment disappeared as efficient technology was introduced and, as production was oriented towards fulfilling the demands of high- or medium-income sectors, the productive and social fabric began to change, becoming polarized. In particular, this second stage did not solve the balance of payments problems and generated a

new kind of 'dependence', a word with more precise political connotations, which in the 1970s, began to replace 'development'.

The population, which had grown moderately throughout the nineteenth century – with the exception of the areas of mass immigration – expanded dramatically between 1930 and 1940. Mortality, which was traditionally high, plummeted owing to the combined effects of antibiotics, insecticides and vaccination programmes, which eradicated malaria and other epidemic and endemic diseases. This completed the task begun at the beginning of the century in the large cities with the installation of sewage systems and running water. The naturally high fertility rate remained higher than expected and, except in the case of the societies of the Southern Cone, where 'demographic transition' did occur, was unaffected by improvements in living standards or the migration towards the cities. Between 1940 and 1970, the population of Latin America grew from 126 million to 278 million, the highest growth rate in the world, exceeding even that of sub-Saharan Africa. Only in the last two decades has the growth rate slowed somewhat. The effects of the population explosion, and particularly the existence of large cohorts of young people demanding education, employment and services, were numerous and gave rise to conflicts and changes, many of which were already latent in the archaic Latin American system.

In the more traditional rural areas demographic pressure on the land, which was unable to provide a living or even a home for these new contingents, became evident. This problem was aggravated as the capitalist sectors or simply the large landowners rapidly encroached upon the land still held by indigenous communities. This led to violent conflicts. The indigenous world, which until that point had remained isolated and protected, began to suffer all manner of assaults at the hands of modern society – roads, communications, market forces, state regulations – all of which eroded the ancient community links. Political demands also emerged. As in Mexico at the beginning of the century, the *campesinos* in El Salvador, Bolivia and Peru rallied together and demanded to be taken into account, becoming political agents in their own right.

The 'land reform' proposal incorporated all these demands in an ambiguous and contradictory programme. This reform would transform the old agrarian world, affecting both the *campesino* communities and the inefficient, patriarchal landowners who embodied the 'colonial heritage'. This transformation was to turn the rural environment into the great engine of economic development and, at the same time, the sphere where the traditional *campesino* claim to the land would be satisfied. This was one option; in Bolivia, as had occurred earlier in Mexico, these demands were heeded, sacrificing development and even an effective means of keeping the *campesinos* themselves on an inadequate area of land. In other places, such as El Salvador or in Chile under Pinochet, modernization along capitalist lines further hastened the expulsion of the *campesinos*.

The agrarian frontier advanced, encroaching upon new lands, such as the Amazon, which was invaded by Brazil, Bolivia, Peru and Colombia at the expense of the backward, traditional indigenous populations. Perhaps the most efficient and productive agricultural frontier was the cultivation of coca leaf, and more recently poppies, stimulated by the drug trade. Strictly speaking, this has been the most successful export in the latter part of the twentieth century. The benefits reached the *campesinos*, but the price to be paid was that of increased conflict and violence, settled by large armed organizations where the traffickers mingled with ex-guerrilla fighters.

The solution to these conflicts frequently involved an exodus to the cities, which grew significantly as a result. By the end of the twentieth century, 40 per cent of the total population lived in towns of more than 20,000 inhabitants. At first, expulsion from the land was aided by the attraction of finding industrial employment, and later simply the possibility of surviving by doing odd jobs or in the vast 'informal' economic sector, but the exodus was primarily a response to the increased expectations generated by the city itself. However wretched life might be there, urban poverty, which might include possession of a television set, was infinitely more attractive than the prospect of traditional rural poverty. This was not merely an individual decision. In Peru, whole mountain communities carefully planned their transfer to one of the hills around Lima. In other cases, relatives or neighbours summoned new migrants and together they used the tactics of their old subsistence culture to help them in the difficult task of making their way in the city.

In cities such as São Paulo, Mexico City, Santiago, Caracas and Buenos Aires, the slums and shantytowns spread so that the population explosion took the form of concrete and tangible problems. The water, electricity, sewage and hospital services were inadequate for the number of inhabitants of the 'young towns', perhaps so-called because the number of young people was the most outstanding manifestation of the population explosion. Also, there were not enough jobs, and the growing demands on the education system could not be satisfied. They could legitimately be called the urban masses; there were many of them and, apart from the bodies representing the traditional industrial workers, their organizations were not too visible.

Politics underwent profound change. The populist politics of Vargas in Brazil (1930–45 and 1951–54), and Perón in Argentina (1946–55), meant involving the masses from a position of power, giving in to some of their demands, anticipating others, all the while controlling and containing them. Their example was followed by many in different ways, but in every case it proved to be a way of involving the working class as citizens and members of society. This policy often went hand in hand with nationalism. The all-embracing slogan of nationalism was nurtured by traditional anti-imperialism, which had developed in the period between the wars and during the post-war period, but it was mainly a proposal for the effective integration in national life of diverse, splintered societies, such as those where the indigenous communities had reached the twentieth century as vigorous, coherent societies. In many instances, these nationalist, populist policies aimed to mobilize and integrate the traditional *campesino* classes, as the Mexican Revolution had done. This was the aim of Arbenz in Guatemala, the MNR in Bolivia in 1952, and the Peruvian Revolution in 1968.

However these elements were combined, the role of the state was a preponderant one. It had both to foster the organization of workers and *campesinos* and at the same time to control them, promoting social policies and redistributing resources where these were abundant. The state's legitimacy derived more from the democratic forms of plebiscite than from the more traditional forms of liberal

*Map 14*  **Post-1945 military regimes in Latin America**



UNITED STATES OF AMERICA

MEXICO

CUBA  1952

1952-59 *Batista*
1959- *Castro*

HONDURAS
1957,
1963,
1972,
1978

1932-48 *Carias*

HAITI
1991

1957-86 'Papa Doc'
then 'Baby Doc' Duvalier

1991-94

BELIZE

JAMAICA

DOMINICAN REPUBLIC
1963

1930-61
*Trujillo*

*ATLANTIC
OCEAN*

GUATEMALA
1954,
1963,
1982,
1993

EL SALVADOR
1948,
1979
1932-82
(military presence
in power elite)

NICARAGUA  1936-79 Somoza dynasty

COSTA RICA

PANAMA
1968
1968-81
*Torrijos period*

VENEZUELA  1948
1948-58

GUYANA
SURINAM
Fr. GUYANA

COLOMBIA  1953
1953-57

ECUADOR
1963
1963-66
1972-79

PERU
1962,
1968
1968-80

*PACIFIC
OCEAN*

BOLIVIA
1951,
1964,
1969,
1971,
1978
1979,
1981

1964-82 (mostly
under control of
military officers)

BRAZIL
1964
1964-85

PARAGUAY
1954
1989
1953-89
*Stroessner*

CHILE
1973
1973-90
*Pinochet*

ARGENTINA
1955,
1962,
1966,
1976
1955-58
1976-83

URUGUAY
1976
1976-84

Military coups and/or takeover, with date

Country with prolonged military regime

1953-57  Dates of prolonged military regime

1953-89
*Castro*  Dates of a military dictatorship

Adapted from E. Baquedano et al., 1998, *The History Atlas of South America*, MacMillan Continental History Atlases, MacMillan, New York, p. 133.

constitutionalism, which were pushed to the limit and then rejected, as occurred in Vargas's *Estado Novo* in 1937. In most cases the Armed Forces acted as guarantor for these political experiments and for the leaders, who behaved more like chieftains than representatives of an institution. They were often described as dictators and they probably were (Map 14). In the second half of the 1950s, many of them fell from power: Perón in Argentina, Rojas Pinilla in Colombia, Ibáñez del Campo in Chile, Pérez Jiménez in Venezuela. The age of the great civil parties had arrived. Democratic Action (Acción Democrática) in Venezuela, National Liberation (Liberación Nacional) in Costa Rica, the Christian Democrats (Democracia Cristiana) in Chile. They took on the responsibility of channelling development and reform along democratic lines, at the same time erecting a stout barrier against communism, opposition to communism being the primary demand of the United States. In Peru, another great party (APRA), under the leadership of Víctor Raúl Haya de la Torre, also aspired to meet this demand, but failed. APRA had arisen earlier as a popular, nationalist, anti-imperialist movement and it attempted to adapt to the prevailing climate by becoming the champion of democracy and anti-communism. However, it did not succeed in overcoming the disapproval with which it was traditionally regarded by the military establishment.

The political scene changed dramatically with the Cuban Revolution, led by Fidel Castro in 1959. Shortly after the triumph of the revolution, the unyieldingly hostile policy of the United States threw Cuba into the Soviet camp, hastening the adoption of the Soviet socialist model. The results were, and still are, subject to interpretation. The great achievements in the fields of education and health care or the democratization of social relationships were not accompanied by significant successes in the field of growth or even in the diversification of the economy. However, for a long time, revolutionary Cuba exercised a tremendous influence on the political imagination of the region, offering an alternative both to the old regimes, which still survived in many places, and to the lukewarm proposals for reform. Furthermore, it offered a practical alternative, rural guerrilla warfare, the insurrectional cell, which was extremely attractive at the time of the Viet Nam War or the student unrest in France in 1968, or in the atmosphere of post-Vatican II, which proclaimed its support for the poor and was interpreted by many 'Third World' priests, such as the Colombian Camilo Torres, as an invitation to join specific struggles. Rural guerrilla warfare took root in many places – Colombia, Venezuela, Peru, and in a number of places in Central America – adding a new dimension to old social conflicts. Then urban guerrilla warfare made its appearance in Montevideo, Buenos Aires and São Paulo. In 1970, this same trend inspired the Chilean democratic left under President Salvador Allende to draft a project for a democratic transition towards socialism. The Cuban message was also present some time later in the 'Sandinista' movement, which triumphed in Nicaragua in 1979, as well as in the Salvadorean and Guatemalan guerrilla movements. In the 1970s, the latter succeeded in mobilizing the *campesino* communities, thus bringing down upon it fierce military repression that was denounced by Rigoberta Menchú, who won the Nobel Peace Prize in 1992. Echoes of the Cuban message are even apparent in the demonic Shining Path (Sendero Luminoso) Movement in Peru,

which isolated the component of pure violence from the more general humanistic proposals, which had inspired the original ideas.

There was a widespread wave of discontent, generated perhaps by dissatisfaction born of promises of development, agrarian reform or democracy, which had remained unfulfilled. Parallel to this, the armed forces set themselves up in every country as the custodians of what, under the influence of the United States, was called the 'ideological frontier', which allowed the enemy to be singled out on the ground and hunted down until annihilated. Such military repression resulted in death, torture and exile on a massive scale, in Brazil after 1968, in Uruguay and Chile after 1973 and in Argentina after 1976.

## The crisis

Throughout the 1970s, Latin America suffered the impact of the oil crisis and then the forced debt crisis in which governments found themselves immersed. Caught in the vice-like grip of a debt which it was impossible to pay, states were defenceless and powerless, being obliged to yield before the decisions of their creditors, coordinated by the International Monetary Fund, at a time when the restructuring of the capitalist world was forcing individual national economies to eliminate tariff barriers. Whole productive sectors succumbed in this confrontation, particularly the industrial sector, while the institutions which had grown up under the welfare state were dismantled by that very state, sometimes with the backing of market forces and sometimes using terror tactics.

While the various national economies thrashed about aimlessly, their respective societies, which had been invigorated by the successive waves of transformation occurring throughout the century, entered a decline that led to a sharp polarization within society, where a small but not insignificant percentage of the population managed to adapt to the new conditions, whereas large sections of society were marginalized. This change is most apparent in the big cities. The great metropolises grew in spectacular fashion, and there are few cities anywhere in the world as huge as Mexico City. The word metropolis has been replaced by the word mega-city to describe this new reality, since inter-city spaces are being gobbled up as the cities grow, soon to merge into one single, sprawling conurbation. This is what is happening along the Argentinian coast from Rosario to La Plata and in Chile between Santiago and Valparaíso. At the same time, urbanization is accentuating the gap between two worlds: on the one hand, the world of those whose high purchasing power allows them to follow the trends prevailing in the global society and, on the other, the vast universe of poverty, unemployment, deprivation and defencelessness. All the things, such as shared education, health-care systems, and even safety and the law, which in more prosperous times had contributed, albeit incompletely and with difficulty, towards social integration and expanding the middle classes, are now split between those services which are adequate for those who can afford to pay for a private clinic, school or private security services and those who must make do with what can be provided by an increasingly niggardly state ever less concerned with the common good. The paradox is that this separation is occurring alongside the tremendous levelling process being generated throughout

the world by the latest technological revolution, the inhabitants of the most exclusive residential suburb and the poorest shantytown hovel may all be watching the latest CNN news broadcast at one and the same time.

Little is known about how social links are rebuilt in the world of the deprived where so many things, from schooling to membership of trade unions, no longer make any sense. Perhaps conditions are ripe for traditional social patterns and survival mechanisms carried over from a not too distant rural experience to flourish. Maybe new forms of religiosity, from basic Catholicism to Pentecostal movements or myriad other rites, will fill the space occupied until recently by political organizations. What we do know is that confidence in the forms of political relations based on liberalism and democracy will not take root easily in such societies.

During the 1980s, Latin America witnessed a vigorous pro-democracy movement, particularly in those countries that had suffered the most under terrorist dictatorships, such as Argentina, Uruguay, Chile and even Paraguay. In many cases, alongside this trend, we find that civil society managed to recover the initiative once again, but this honeymoon did not last long. Dialogue broke down, and from the midst of some of these very societies authoritarian regimes found massive support – as in Peru, for example – whereas elsewhere society grew indifferent to governments which, for their part, shamelessly paraded the corrupt conduct that had previously been practised, on a smaller scale or with greater discretion. Lack of interest in democracy was compounded by a passive questioning of the legitimacy of governments similar to that encountered by the Partido Revolucionario Institucional in Mexico, which was impotent to deal with the challenge posed by the *campesinos* of Chiapas. For the first time its wretchedness has been paraded in public for all to see. Equally representative of these new times is the armed movement accompanying the voice of the *campesinos*, using the name of Emiliano Zapata, which declares that it does not aspire to take power (1970s), but merely to construct a new structure of political relationships. In this, as in many other areas, the uncertainties facing Latin America as it approached the end of the century far outnumbered the certainties, and the prospects are tinged more with anguish than with hope.

## SCIENCE AND TECHNOLOGY

Without going back too far in time, though far enough to get a perspective on the changes that have occurred, it can be said that preoccupation with scientific matters, their significance and repercussions is evident from the early nineteenth century onwards. One of Simón Bolívar's central arguments justifying the emancipation of the colonies was that the metropolis did not allow them to engage in science. This same argument was put forward in several other countries. The alternatives stemming from the civil wars and efforts to consolidate the nation-state are possible explanations for their backwardness compared to the momentum of the Age of Enlightenment seen elsewhere. The modest scientific efforts undertaken, mostly aimed at catching up but including some original contributions, were totally overshadowed by the processes of political organization and the structuring of the universities. Because this is a matter of some importance, it must be pointed out

that, despite a number of attempts in that direction, in Latin America there was no equivalent of the Industrial Revolution, which, at this time, was transforming productive structures in Europe. Neither is it fortuitous that the proponents of an 'industrial' policy for Latin America, such as Sarmiento in Argentina and others, also demanded a scientific policy based on the modernization of existing institutions, the creation of new ones and the recruitment of foreign academics, particularly in the field of natural science.

However, the need for professionals helped shelve basic scientific research, which was nearly always limited to individual efforts or concentrated in inherited or poorly maintained establishments. Nevertheless, it did help alter the cultural climate to some extent, making scientific activity more accessible and sensitive by giving it a certain growing social prestige. On the other hand, in the production and service industries the boost was less significant. Perhaps the incentive derived from the transformation or creation of museums, setting up of astronomical observatories, founding of botanical gardens and laboratories, activities in the field of natural science, and marking of national boundaries – all activities having greater impact at that time. Scientific periodicals in Spanish were scarce, as was the space devoted to science in the press generally. This lethargic situation began to change as the ideas of positivist philosophy linked to 'modernization' began to circulate, and railways, regarded by some as the 'engine of progress', and certain mining and, to a lesser extent, manufacturing activities linked to the transformation of local raw materials began to make their appearance. It should also be remembered that the controversy surrounding the theory of evolution caught the interest of a much wider public than usual.

In very general terms it may also be said that during the early decades of this century scientific research was shelved owing to the lack of flexibility evident in the focus of the universities, which adapted their professional outlook in response to the immediate needs of society and the state. Contrary to general belief, imports of increasingly complex machinery and equipment did not necessarily create the right conditions for local scientific and technical development to get off the ground. In fact, such imports were often instrumental in weakening and postponing such development. During the boom years of apparent prosperity, when imports were encouraged, a pragmatic, utilitarian attitude evolved that worked against the development of scientific research in the long term. On the other hand, certain favourable circumstances should be pointed out. One example is the incentive provided by foreign institutions, which were not always disinterested in their motivation by any means and, in some cases, whose intentions were clearly political. This is true of the contribution made by Germany in the period between the wars to the establishment of an important school of physics at the University of La Plata in Argentina. Germany sent excellent teachers and provided scholarships for postgraduate study. This case has been thoroughly studied and the conclusions may shed light upon other similar situations. After the second post-war period, 'development' ideas triumphed. Owing to their excessive economic bias, they assumed that science and technology would be a natural by-product of development.

Another significant factor was the gradual professionalization of university teachers, which, with the arrival of full-time positions, allowed teachers to devote

time to scientific research. The growing prestige of the natural sciences and advances in medicine, opening up promising avenues of research, fostered the creation of highly specialized institutes that gave rise to the three Argentinian Nobel Prize winners: Bernardo A. Houssay (1887–1971), who won the Nobel Prize in 1947 for his research on the functions of the hypophysis (pituitary gland), including its relationship to hydrocarbon metabolism; Luis Federico Leloir (1906–1987), who won the Nobel Prize for Chemistry in 1970 for his outstanding contributions to understanding the functions of enzymes in the synthesis of polysaccharides; and César Milstein, who won the Nobel Prize in 1984 for his research into monoclonal antibodies. These scientists, along with many other names that might be added, show that the state of Latin American science was often on a par with science abroad.

Gradually a number of institutions arose in Latin America whose aim was to promote activity in basic science: the Asociación Argentina para el Progreso de la Ciencia was founded in 1934, and in 1945 began to publish an important scientific journal, *Ciencia e Investigación*; the Sociedade Brasileira para o progresso da Ciência was founded in 1948; and the Asociación Venezolana para el Avance de la Ciencia (ASOVAC) was founded in 1950. Although, from the second decade of this century onwards, some scientists had already begun to warn of the need to promote science and organize and institutionalize scientific activity, these organizations did not begin to emerge until the middle of the twentieth century. The Conselho Nacional de Pesquisas (CNP, Brazil) was founded in 1951; the Consejo Nacional de Investigaciones Científicas y Técnicas (Argentina) was founded in 1958. Mention must also be made of the appearance, during the following decades in a number of countries, of higher technological institutes associated with research in the fields of agriculture, oil, and atomic energy. The boom in such dynamic branches of science as physics and biology was not unrelated to this climate.

Owing to the financial support provided for these fields and the fixing of priority subjects, the strong European and North American influence was felt not only in activities geared towards physics and the natural sciences, but also in the social sciences which, after the Second World War, attempted to achieve intellectual independence and establish their own personality somewhere between Germanic philosophizing and the pragmatic approach of North America. Specific problems, incompatible with the criteria and orientation imposed by the central countries, prompted this search for autonomy. The so-called population explosion and the model of urbanization, which occurred in Latin America, called for explanations, which the hypotheses and arguments used until that time could not supply.

Whereas foreign academics continued to arrive until the second post-war period – expelled from the Old World as a result of the First World War, the 1930s crisis, the racial and political repercussions of the period between the wars, the Spanish Civil War and the Second World War – this trend was reversed after the middle of the century, and a constant brain drain of considerable proportions was established in the opposite direction. This trend coincided with the growing number of military dictatorships in Latin America, the recovery of the central countries and the spectacular advances in several fields of science and their applications.

The influx of foreign technology also became one of the greatest hindrances to state and private investment in research and development. Great debates concerning the economic and political significance of this trend began then and are still going on. The conclusions reached almost always went unheeded by the business sector, which preferred to go abroad in search of technology, processes and patents.

UNESCO's *World Science Report 1993* carries a valuable study showing the present position of Latin America in relation to other regions, indicating the main problems, analysing budgets, and attempting to quantify scientific production as well as the most important obstacles. 'The progress of science in Latin America is being hampered by a scarcity of human resources, a marked lack of economic resources, the relative isolation of researchers in certain fields of knowledge which are only slightly cultivated, and limited regional and international scientific cooperation'.[1] The lack of human resources, the study continues, is due to three main factors: deficiencies in the education system, scarcity of scholarship assistance and low compensation schemes.

For a number of reasons, scientific and technological research, particularly at basic levels, has lost the vigour that was generated during the twenty years following the Second World War. The evidence of the twentieth century so far shows that the role of private enterprise is almost insignificant and, in view of investment trends, there is no indication that the situation will improve.

Two fundamental factors emphasize the worrying importance of this matter on the eve of the new millennium; the first is the ever-widening breach between the developed countries and the rest of the world, and the second is the growing role of science and technology in the transformation of society. In recent years, both these subjects have generated an abundance of stimulating publications, particularly national and regional studies, as well as other studies of a doctrinaire nature, which have an important contribution to make in the definition of problems and the search for responses to them. We shall simply recall, among other previous works, two valuable collections published by UNESCO, which provide an excellent theoretical starting point. The first of these is *Science and the Factors of Inequality: Lessons of the Past and Hopes for the Future*, written by a broad-based group of intellectuals and compiled by Charles Morazé (1979);[2] and the second is *Domination or Sharing: Endogenous Development and the Transfer of Knowledge* (1983), which reflects the spirit of UNESCO when it says that 'the concept of endogenous development has its place in UNESCO'S programme as a major forum of reflection with regard to the complex and many-sided process of development'.[3] It continues: 'If development is to fulfil people's expectations, it cannot be patterned on an outside model; it must be achieved in accordance with goals and methods freely chosen by each individual society, care being taken to ensure that transfers of knowledge in the social and human sciences, as also in technology, do not impede endogenous development, but, on the contrary, help get it off the ground. With this end in view, the exchange of knowledge should prevail over the mere transfer of knowledge, which runs the risk of producing effects of domination'.

Recent developments in the fields of communications, genetics, physics, and above all developments in the field of

nature conservation, update this discussion in a most dramatic way, highlighting the ever-present risk of Latin America being once again left by the wayside in this new and profound, multi-faceted revolution.

## CULTURE AND THE ARTS

Early in the nineteenth century, taking up an idea that had already made its appearance in the previous century, some thinkers, such as the Argentinian E. Echevarría and Andrés Bello, realized that there was no automatic link between political and mental emancipation. Neither was it enough to reject outmoded colonial ways. It was necessary to rediscover both the geography of Latin America and its human inhabitants in their own right rather than in relation to Europe. Criticism was drafted using tools of European origin, which hindered comprehension of what was characteristic and original. The great challenge was to find different perspectives and to recognize the need to devise new instruments or models, in short, to find an appropriate language. José Luis Romero, a historian, maintained that one of the greatest obstacles always encountered is that of studying new phenomena using old classifications. This is particularly so when change is rapid. The challenge here was to apprehend a 'new world', which was complex and variegated, with all that implies. From the Enlightenment onwards thinkers, artists and sensitive individuals strove, not always aware of what they were trying to achieve, to perceive the originality of the society that was emerging, and to anticipate the course it would take. To do so, it was necessary to abhor 'tradition'. In other words, discovery of reality and assimilation of European trends were interwoven. The critical spirit is strengthened when it is applied in greater depth to creative analysis.

Furthermore, both the Spanish and Portuguese languages were infiltrated by words and expressions taken from the indigenous languages that, in vast regions, have survived up to the present time and, as they are spoken by large numbers of people over a huge area, cannot by any means be regarded as isolated linguistic pockets. Even today, more than five hundred years after the encounter between these two worlds, there are still people who dream of recovering languages such as Quechua or Guarani, to mention only two; we are aware that a rich popular literature exists in these and other indigenous languages. The controversy does not end here. Rather, it is being reopened, in view of the magnitude of the migrations from the country towards the city and of the fact that culture is still not playing the integrating role that was expected of it.

The environment in which this process developed was not satisfactory – geographical dispersion, marked social differences, apparent in high illiteracy rates and a predominantly rural population. This should not be regarded merely as a confrontation between the country and the city but as an attempt to find a synthesis demanding a more uniform society and greater cultural consistency. The perception of the world was also undergoing change; science, initially natural science, was bringing secularization and modernization along in its wake. All this generated great tensions which, it was assumed, could be mitigated by an acculturation process fostered by national policies for integration and education, which would rescue people from marginalization and exclusion, turning them into citizens, producers and consumers.

The size and complexity of a continent such as Latin America as well as the transformations it has undergone defy any attempt to divide history into periods. The divisions used to mark out historical, economic and political events have not always proved useful from the cultural point of view. Some years ago, in an attempt to find a method appropriate to the study of this cultural process, we developed a criterion which, in our view, aids understanding. The periods generally known as the 'colonial period' and 'independence' seem over-schematic and rather vague. They also carry strong connotations of backward traditionalism. In our opinion, cultural development may be divided into three broad areas, namely: imposed culture, accepted culture and criticized culture. The first category, that of 'imposed culture' coincides in general terms with the colonial period, but it outlives that period because it continues beyond the historical division usually made at the beginning of the nineteenth century. The idea of an imposed culture lived on until political emancipation was attained. In the case of Cuba this was at the end of the century. In Brazil, events developed differently from Spanish-speaking countries; slavery was abolished late (1888), the monarchy was abolished the following year, and Brazil made an atypically peaceful transition to a republic. During this period, the prevailing models and values came from outside and the policies implemented were designed to benefit the metropolis. The second period, which we call the period of 'accepted culture', coincides with the beginning of emancipation in the majority of Spanish-speaking countries. This period, which economists were later to call the period of 'outward growth', is marked by closer ties with Western Europe and the United States, whose models, values and fashions were generally accepted as prestigious, and there was little concern with making them compatible with a different reality. The third and final period is that of 'criticized or disputed culture', when the values formulated and accepted during the previous period were gradually rejected, while the ideology of those who denied them was recovered.

Gradually the so-called 'modernizing elites' took the Latin American stage. Their gods were unknown during the previous century – the railroad and in particular the locomotive, steamboat, telegraph and telephone – but they also worshipped something which was more human, although abstract, an implicit project for 'outward growth' which involved joining the international marketplace, where the pound sterling and the gold standard were venerated. This gave rise to relative economic stability often at the same time as economic growth, which attracted waves of investment capital and people. By adopting the ideology of economic liberalism, these countries set out along the road to a kind of 'normality'. They tried to make this ideology compatible with paternalistic and oligarchic attitudes and even with slides into dictatorial and authoritarian regimes, such as that of Porfirio Díaz in Mexico or Antonio Guzmán Blanco in Venezuela. These were the years of 'strong governments', and in almost every case it is apparent that the number of foreign loans increased and public works projects flourished; bridges, roads, public lighting, sanitation projects, railway stations, ports, monumental buildings and parks were built, works of art were acquired abroad, and bad taste abounded among the new urban sectors. The

economy showed the influence of Britain, and France left its mark in the field of culture. That is why there was so much talk of 'efficiency' or 'profit' in the former case and of 'fashion' and 'good taste' in the latter.

At first sight these countries seemed peaceful and prosperous. In any case, these were times of order and promising prospects rather than times of freedom. From afar they offered an immense cornucopia. The ruling classes had allowed themselves to be carried away by the 'madness of speed', as the saying went at that time. Some of them were said to believe that 'Enlightenment is the true engine of progress', which explains the constant preoccupation with educational legislation that was rarely implemented. Inevitably, modernization affected daily life – the home, clothing and entertainment – and people read books and magazines, which they had never done before, and the reading public grew. However, some sensible people murmured under their breath, 'So much luxury and so little social well-being'. In their day, the Mexican Revolution and the University Reform, which started in Córdoba (Argentina), sounded notes of warning, albeit of varying intensity. Criticism of positivism grew.

The renewal of Spanish-language poetry and prose owes a great deal to this movement, which introduced innovations in both vocabulary and syntax. Leaving to one side the best-known forerunners, the most outstanding exponents were the Nicaraguan Rubén Darío and the Uruguayan José Enrique Rodó. It is a strange paradox that these two men from small countries should stretch the limits of the American continent perhaps to an extent unprecedented in our cultural history. But it would be wrong to think that modernism, which a few decades later would in turn be exhausted and reduced to artificial refinements that would be dispersed by the vortex of the avant-garde movements, was strictly a literary movement. It also left its mark in other fields such as painting and music. Some interesting expressions are still to be found on the jackets of many books published on both sides of the Atlantic that preserve for us that style, which we now find melancholic, that has left its mark on homes, furniture and ornaments that have survived real-estate speculation and auction fever.

As we have already pointed out with regard to many other areas, there is a significant difference in chronology between cultural development in Brazil and the rest of Hispanic America. It was some time later that a vigorous, but distinct, form of Brazilian 'modernism' made its presence felt at the now famous Semana de Arte Moderno de São Paulo in 1922. This event ushered in a period of particularly intense cultural activity and aimed to break with the conventions and academic attitudes prevalent at the time. Its effects were felt in literature as well as in music and the visual arts. The way was prepared, among other things, by the translation into Portuguese of the most significant documents of the avant-garde movements of the Old World. This was due primarily to Oswald de Andrade who, together with Manuel Bandeira and Carlos Drummond de Andrade, are normally regarded as the foremost exponents of this movement, which reveals a strongly anti-traditionalist and non-conformist attitude, rejecting the past in the name of a future full of grandeur and repudiating European artifice. Two quotations, taken from Jean Franco, illustrate this position. Rejecting the sway of linguistic conservatism and in support of the renewal of the language, Manuel Bandeira calls for: 'Every word, particularly universal

barbarism. Every construction, particularly abnormal syntax. Every rhythm, particularly those which shun metre'. For his part, O. de Andrade says: 'What are we, people of a thousand origins who have disembarked from different ships, but futurist? We cannot be otherwise.' This attitude is expressed effectively but with humour in the *Manifiesto Antropófago*: 'tupí or not tupí. That is the question'. In the opinion of Ana Pizarro, in the field of the visual arts this attitude is reflected in the famous painting of Tarsila do Amaral, *La negra*.

A significant fact is that the supporters of this nationalist 'modernism', who rejected literary regionalism, were receptive to the growing influence of 'naive' painting and the development of dance music, with its existential rhythms, which are rich expressions of the Brazilian spirit.

In a number of his works, the famous Brazilian critic Antonio Cândido focuses our attention on and analyses the turning point in Latin American cultural life that took place early on with the formulation of optimistic assumptions based on the idea that these were 'young countries', i.e. societies, whose future looked promising, that would be capable of overcoming the difficulties and constraints hampering the development of a bright and fertile future and, on the other hand, the pessimistic anguish born of the realization, already apparent before the middle of the century, that ours are underdeveloped or, more charitably, developing nations. The challenges to be met in the first instance were many, but it was assumed that with optimism and good will these obstacles could be overcome. However, during the second stage the evidence was more disheartening. If some literacy campaigns were relatively successful, these triumphs did not always lead the newly literate to the world of written culture. Instead, and this is shown convincingly by A. Cândido, they fell almost straight away under the influence of radio broadcasts, comics and television. The newly literate remained in a cultural limbo, because they were bereft both of the traditional values and of those that were considered necessary for modernization.

## Literature

Sometimes an apparently incidental comment may reveal a great deal about a situation. Rosalba Campra, in *America Latina: l'identità e la maschera*,[4] relates how in 1960 Roger Callois advised the publisher Gallimard to eliminate the collection *La Croix du Sud* because it had been successful and so was no longer necessary. It was now a part of world literature and should therefore be included in the collection *Du Monde Entier* along with German, Italian, Japanese and North American books. If we are to judge by these remarks, a literature with specific traits had managed to join the mainstream of world literature. In fact, and here the pioneering work of R. Callois must be recognized, this observation reveals a profound change in the importance attributed to Latin American literature, which, through one of the 'cultured languages' of the period, had triumphed and been consolidated. It was no longer necessary to resort to geographical limitations or adjectives or to stress the exotic nature of the works in order to attract readers. In other words, it had overcome its geographical 'confinement'. During the twenty years from 1940 to 1960, the books by a number of authors bore witness to the fact that they were on a par with the best literature being produced anywhere

in the world. 'Segregating' them was therefore not only useless but also even harmful; the reading public and literary critics had already consecrated them alike.

The same may be said of music and the visual arts, although the time scales do not coincide, sometimes anticipating literary movements and sometimes developing later. In the simplest of terms, it may be said that from the First World War onwards, artistic and literary activity in Latin America underwent a profound change: although it continued to be receptive to influences from Europe and North America, it gradually consolidated its own identity which had been developing for several decades. However, it must be recognized that the many *avant-garde* movements from Europe and North America played a leading role from the critical point of view and in the sense that they provided new instruments which helped strip language of old academic trappings and cramping regional movements, allowing new devices to be adopted which, as well as being more original, were also, and more importantly, more authentic.

Without committing the unpardonable offence of omitting the forerunners, clearly a series of socio-economic and cultural factors promoted this change in the cultural climate: a strong trend towards urbanization, a significant reduction in illiteracy rates, the emergence of a new public and the appearance of the means to transmit and broadcast to the existing public, i.e. the establishment of a publishing industry and later the appearance of radio and the recording industry, followed in more recent times by cinema and television. The range of themes gradually expanded and perspectives broadened. It was not merely a matter of portraying rural problems from this or that region or questions raised by the indigenous people in this or that country, the formation of new social groups such as the middle classes, or typical political manifestations such as the existence of dictators. These topics triggered a vast literary production, some of which is of outstanding quality and lasting value. The most salient point is that the aesthetic quality of these works imbued them with a universality, which is all the more significant since they did not set out to achieve it. The artistic yeast had acted as a kind of enriching alchemy.

Another possible method of assessing the importance of Latin American literature would be to enumerate the number of Nobel Prizes won by writers from the region: Gabriela Mistral (1945), Miguel Angel Asturias (1967), Pablo Neruda (1971), Gabriel García Márquez (1982) and Octavio Paz (1990). However, a more effective indicator would probably be to recall that the works of Jorge Luis Borges, Pablo Neruda, G. García Márquez and Octavio Paz are held in great esteem in the halls of universal literature. Not only have they been translated into numerous languages, appearing in the catalogues of the great publishing houses the world over and in academic syllabuses but, more significantly, they have been and continue to be influential. This is confirmed by the number of imitators to be found beyond the confines of the continent. To mention only one, Jorge Luis Borges, who did not receive the Nobel Prize, is a compulsory point of reference in every literary circuit and has numerous 'imitators' from Japan to Germany.

This is not the place to record the history of or even to outline in detail, the most outstanding manifestations of Latin American literature, whether for its intrinsic values or its universal interest. To do so would require us not only to distinguish between a number of movements, which are not always easily distinguishable, but also to provide a summary of the personal development of the various authors, situating them in relation to events in each country and period. It would also be necessary to follow up local influences as well as those coming from beyond the confines of the American continent, the role of the critics, the existence of magazines and publishing houses as well as the changing nature of the public, whether in number, location or tastes. There are also eclipses and rediscoveries, which are not always easy to explain. Consequently, we have opted to select a small number of names, all of whom are true milestones, whose works are known through numerous translations, and the studies dedicated to them. Furthermore, they have already earned their place in world literature and constitute a compulsory point of reference in any conscientious study of cultural development during the twentieth century. We have therefore chosen a sequence that shows the dynamic current running through different nations, periods and a variety of aesthetic movements, quoting only essential dates and, in most cases, mentioning only one work which, in our view, may be regarded as the most significant.

On the other hand, and almost simultaneously, a series of other novels appeared which are today regarded as 'classics', both on account of their lasting value and because they enriched, often in a sensational way, knowledge of the Latin American countryside and its inhabitants in their various dimensions, drawing back veils which had hampered in-depth knowledge of life on the tableland, in the jungle, on the savannah and the pampa, portraying the existence of blacks, Indians, immigrants, rural workers, rubber trappers, miners, fishermen and lumbermen. These were works of exploration, which helped assemble the variegated jigsaw puzzle contributing to a better understanding of these societies. Although some of these novels and short stories were regarded as examples of social, regional or *costumbrista* literature, hindsight shows that they made a valuable contribution to the integration and cultural maturity of the continent. This may explain why today many more recent works sail freely through the waters of universality bearing Latin American flags.

By classics we mean: the novels of Venezuelan Rómulo Gallegos (1884–1969; *Doña Bárbara*, 1926); Colombian José Eustasio Rivera (1888–1929; *La vorágine*, 1924); Argentinian Ricardo Güiraldes (1886–1927; *Don Segundo Sombra*, 1926); the admirable short story writer Uruguayan Horacio Quiroga (1878–1937; *Cuentos de amor, de locura y de muerte*, 1917, and his original *Cuentos de la selva para niños*, 1918). This list could be expanded to include Ecuadorean Jorge Icaza (1906–1978; *Huasipungo*, 1934: although its artistic merits are less outstanding, this classic denouncing the dreadful conditions of the Indian had a tremendous impact on public opinion); the influential Ecuadorean prose writers of the 1930s and Peruvian José María Arguedas (1911–1969; *Los ríos profundos*, 1958: this beautifully written work with its well-structured plot had a strong impact).

Ignoring divisions into generations or schools as well as classifications weighed down by superfluous subtleties, we ought to mention some outstanding names, which, in our view, paved the way for the 'boom' (in Latin American literature, this term refers to the increase in the number of works translated from 1960 onwards, which had a great impact on European and North American readers and critics alike). These were, among others, prominent figures such as Guatemalan Miguel Angel Asturias (1899–1974;

*El señor presidente*, 1946; and *Hombres de maiz* three years later; his early work *Leyendas de Guatemala* merited a prophetic letter from Paul Valéry); Cuban Alejo Carpentier, who coined the happy term, now so widely used, 'magic realism' (1904–1980; *El siglo de las luces*, 1962); Uruguayan Juan Carlos Onetti (1909–1994; *La vida breve*, 1950 with its exasperated realism where he founded the mythical and fictitious town of Santa María); and Cuban José Lezama Lima (1910–1976; *Paradiso*, 1960, regarded by a prestigious critic as a dazzling work).

These and other writers laid the foundations of the so-called boom, the outstanding figures of which were: Colombian Gabriel García Márquez (1928–2005), whose *Cien años de soledad*, 1967, perhaps one of the cornerstones of twentieth-century literature, is a world of magic and dreams where, in the words of R. Xirau, the story is told 'with a realism so precise and so raw that he transforms reality into legend without depriving legend of its charge of reality'; Argentinian Julio Cortázar (1914–1984), whose *Rayuela*, 1963, undertakes its aesthetic adventure in a spirit of innovation; Paraguayan Augusto Roa Bastos (1917–2005; *Yo, el supreme*, 1974); Argentinian Ernesto Sábato (1911–; *Sobre héroes y tumbas*, 1962); and Peruvian Mario Vargas Llosa (1936–; *La guerra del fin del mundo*, 1987). The above, who are all outstanding novelists, were equally significant as short-story writers. In this latter genre we must mention two great Mexican writers: Juan Rulfo (1918–; *El llano en llamas; Pedro Páramo*) and Juan José Arreola (1918; *Confabulario*), as well as Carlos Fuentes (1925–), who has also tried his hand as an essayist.

Contrary to a commonly held view, it was not only in the field of fiction that Latin American literature shone. There are a number of eminent essayists such as Mexican José Vasconcelos (1882–1959); Pedro Henríquez Ureña (1882–1946); Gilberto Freyre (Brazilian, 1900–1987); the unique stylist Mexican Alfonso Reyes (1889–1959); the vigorous and admirable Argentinian Ezequiel Martínez Estrada (1885–1964); the remarkable Venezuelan Mariano Picón Salas (1901–1965); the prolific Colombian Germán Arciniegas (1900–1999) and many others.

As the influence of the modernism of Rubén Darío and his most notable followers, such as Argentinian Leopoldo Lugones (1874–1938) and Uruguayan Julio Herrera y Reissig (1875–1910), waned, poetry fell into disfavour, symbolized by a famous sonnet by Mexican Enrique González Martínez (1871–1952), but was reborn under the strong influence of the avant-garde movements. A series of profoundly lyrical and highly expressive poets emerged with Peruvian César Vallejo (1892–1938; *Trilce*, 1922); Chilean Vicente Huidobro (1893–1948; *Altazor*, 1931); Chilean Pablo Neruda (1904–1973), whose *Residencia en la tierra*, (1933–37) is remarkably intense and moving, whereas *Canto General* (1950) attains a degree of splendour expressing the excesses of nature, humanity and the history of Latin America; the extremely refined Argentinian Ricardo Molinari (1898–1996); and Cuban Nicolás Guillén, who rediscovered the rhythms of Afro-America (1902–1989). Colloquial poetry had a great impact on a wider public. This is the case of Chilean Nicanor Parra (1914–) and Nicaraguan Ernesto Cardenal (1925). Outstanding among all of these are two great poets who were also great prose writers, although they never tried their hand at the novel. We are referring to Argentinian Jorge Luis Borges (1899–1986) and Mexican Octavio Paz (1914–1998). As

has already been pointed out, they are both extremely influential, and they both enjoy uncommon recognition on the part of the reading public. They have imitators throughout the world.

In centuries past the participation of women was scarce. The figure of Sor Juana Inés de la Cruz is really an exception. However, in this century a considerable number of women writers, particularly poets, have emerged. Among them are the Uruguayan poets María Eugenia Vaz Ferreira (1875–1924) and Delmira Agustini (1886–1914); Argentinian Alfonsina Storni (1892–1938); the Chilean Gabriela Mistral (1886–1937), perhaps the best known since she won the Nobel Prize; Dulce María Loynaz (Cuba); Brazilian Cecília Meireles (1901–1964). To these we should add, among others, the prose writer Venezuelan Teresa de la Parra (1891–1936). Belonging to different literary movements, they enjoy fame and recognition, as do the more recent generations. Nowadays gender differences are tending to disappear.

The space available prevents us from dealing in depth with another genre, the theatre. This medium is deeply rooted in both popular and high culture, and theatrical activity in spectacularly variegated forms may be traced all the way back through colonial times to the pre-Hispanic civilizations. The twentieth century has found expression in Latin America through a wide range of performance styles and surprising scenic forms, from the 'popular theatres', as non-professional theatres are known in some countries, to the most daring avant-garde creations involving highly sophisticated productions, and from experimental theatre to theatre for the masses. We shall mention only two names: Uruguayan Florencio Sánchez (1875–1910; with his forceful work *Barranca Abajo*, 1905); and Mexican Rodolfo Usigli (1905–1979; *El Gesticulador*, 1937; *Corona de sombre*, 1947 and *Corona de luz*, 1965). As in the rest of the world, the spread of the cinema, which attracted many authors and actors, was a great challenge, which forced the theatre to redefine its role. It is now emerging triumphant and renewed from this exercise.

Brazil also witnessed an intense and very interesting literary movement, similar in some respects to that which occurred in Spanish-speaking America. Although the Semana de Arte Moderna, to which we have already referred and which denied the past, aspiring to find nourishment in the European avant-garde movements, was a decisive milestone in the renewal of the arts and letters in general, the process would be incomprehensible if certain remarkable forerunners were not taken into account, even though they may belong to different aesthetic and ideological movements. Such is the case of Euclydes da Cunha (1861–1909), author of the classic *Os Sertões* (1902), described by Pedro Henríquez Ureña as 'a sombre tale ... powerfully and brilliantly told', or José Pereyra de Graça Aranha (1868–1931), author of *Canão*, 1902, and a supporter of the young participants in the Semana de Arte. In Mario de Andrade (1843–1945), whose work *Mucanaíma, o Héroi sem nenhum caracter* (1928) is a cornerstone, the movement found its most felicitous exponent and inspired creator, gifted with a sensitivity honed by national and popular motifs.

After the third decade of the century, the economic and political upheavals and intense debates that shook Brazil opened the door to a number of movements, which were looked upon in a new light. Among these was the recovery of the regional dimension which, to a certain extent, stood

in opposition to modernism, which was regarded as being too cosmopolitan. This movement produced great creative figures who managed to project their highly aesthetic works at national and international level. José Lins do Rego's (1901–1957) novelistic cycle on sugar cane, begun in 1932, is regarded by Jean Franco as one of the greatest works of this century. Graciliano Ramos (1892–1953; *Vidas Secas*, 1938, and other novels), continues to enjoy great prestige among critics and the general public as does Rachel de Queirós (1910–2003), and Jorge Amado (1912–2001), whose vast production has sometimes been weakened by his concessions to success. Jorge Amado enjoys great popularity on account of the numerous translations of his books, some of which have been turned into films.

João Guimarães Rosa (1908–1966) was the remarkable author of *Grande Sertão: Veredas*, which, with its 'powerful language and subtle expressiveness', and despite the difficulties involved, has been translated into numerous languages and is favoured by critics on account of the richness of its narrative form as well as its narrative perspectives; it has been compared to James Joyce's *Ulysses*. With great aesthetic sensitivity he takes up the popular and colloquial language of the *sertão*, giving it a universal dimension through his inspired linguistic alchemy.

In a shrewd essay on 'Latin American Literature and the Cultural Industry', the Mexican Carlos Monsivais observes that, after the discovery of popular themes and the appearance of literature on this subject, up to Eustasio Rivera, Rómulo Gallegos, Jorge Icaza and others, literature then moved towards social themes under the influence of the emerging middle classes. He adds that radio, the film and recording industries 'mass produce' certain cultural forms, which are despised by the elites. 'The public replaces the People' or, to put it more directly, *people* are replaced by the *public*. One of the results of this is banalization and, on the other hand, 'cinema idols, radio idols, record idols, concert or stage idols' emerge, promoted by the vested interests linked to the cultural industries with their capacity to colonize minds and invent new heroes: Batman, Superman, etc. Monsivais continues: 'Until then, the "truly popular" lay in the rural domain. From that point onwards, what is authentic has also arisen in the relationship between urban life and the cultural industry', a phenomenon which passed unnoticed for many years, as did another, no less eloquent, factor: 'the higher levels of instruction which go hand in hand with growing levels of misinformation'.

'In mass society, what was popular is perforce becoming a minority concern', concludes Monsivais, but not before issuing a warning that, 'although it may seem spectacular, literature is turning towards popular culture and creating towns like Gabriel García Márquez's Macondo or Juan Rulfo's Comala, which enrich our reality'.

## Publishing

The will to quantify is not exactly a Latin American virtue. This is revealed, among other things, by the fact that it is always difficult to find statistics that are reliable, comparable and relevant. This not inconsiderable obstacle makes it difficult to draw up long-term tables of the number of titles published, on what subjects, the size of the print run, the target public, as well as certain other information that would shed light on this most noble of activities. This deficiency is compounded when we look backwards in time to the nineteenth century. The very commendable contribution of bibliographers can in no way fill this vacuum, since their aims were quite different. Neither can we depend upon qualitative judgements, although they may help us establish some link between prosperity and cultural growth, with the proviso that automatic links, which might distort this complex subject, must be avoided.

The development of publishing must be related to the expansion of schooling, the desire to renew the education systems and the gradual rise in living standards, and also the emergence of an urban middle class in nearly every country. These conditions also promoted the search for a new public without disregarding the social groups that had hitherto constituted the reading public. One of the consequences of this was an exploration of the extreme ends of the market: luxury books for high-income groups and popular books to stimulate the growth of the new reading public. Different sales mechanisms were used for each sector, and the topics covered grew more diversified. Markets beyond the national frontiers were also explored.

The two world wars and the Spanish Civil War favoured the development of publishing in Latin America, which grew and matured in the same way as most other industries filling the gap left by imports. Very soon the companies, which had set up operations in the New World, became 'national', i.e. they began to include authors from the countries where they were based in their catalogues. Later they became 'Latin Americanized', which is to say that their 'stables' were enriched by authors and topics from those countries with which they established trading links. These links were strengthened by opening subsidiaries abroad or improving distribution. Outstanding examples of this process are to be seen in Argentina, Chile, and Mexico and somewhat later in Venezuela. Over time, the lack of a specialized graphics industry and of personnel in the fields of translation, layout, and proofreading was overcome. Some examples will serve to illustrate this somewhat abstract argument. The evolution of various collections shows how translations were gradually replaced by original works written in Spanish, as classic and modern Spanish-language authors were included. This promoted considerable integration.

The work of the Fondo de Cultura Económica in Mexico deserves a paragraph of its own on account of the repercussions that it had. In the initial stages it strongly promoted works in the field of economics, but soon included other disciplines, such as philosophy, anthropology, population studies, history, and Latin American classics. Its influence was so great that it even popularized many words drawn from the technical jargon of these and other disciplines.

The directors of landmark collections, which left an enduring mark on the history of our culture, include outstanding intellectuals from both sides of the Atlantic. Obvious examples are José Gaos, José Medina Echavarría, Francisco Romero, Pedro Henríquez Ureña, Luis and Felipe Jiménez de Asúa, Lorenzo Luzuriaga, Guillermo de Torre, Francisco Ayala, Amado Alonso, as well as many others.

From the middle of this century onwards, the number of publishing houses increased, as did the number of titles published and the size of the print runs. A parallel trend towards specialization is noted: children's literature, dictionaries, encyclopaedias, atlases, textbooks, scholarly

works, the sciences (particularly medicine, law, psychology), art and so on. All this implies a complex round of activities, which it is impossible to sum up, since it requires careful analysis. In any case, two significant experiences deserve a mention, however brief: the appearance on the Latin American market of Editorial de la Universidad de Buenos Aires, and on a more limited, strictly national, scale the achievement of Peruvian pocket editions, which managed to sell tens of thousands of copies of works at a series of 'festivals' when the first editions of five hundred or one thousand copies had still not sold out. Peru is a country with virtually no graphics or publishing tradition. The phenomenon was short-lived, to be sure, but it is certainly worth studying.

About the same time, the now flourishing Brazilian publishing industry began to take off. This process went hand in hand with the on-going trends towards urbanization, industrialization, literacy campaigns and, significantly, a real explosion in secondary and higher education. Here, too, the number of translations decreased in favour of original works. The standard of the graphics is quite remarkable. This is to be seen both in popular editions and in editions for the most demanding bibliophiles.


## Music

What is vaguely termed Latin American 'serious music' has not yet achieved the same impact on the international stage as Latin American literature. Perhaps folkloric and popular manifestations, the latter closely linked to dance, festivals and the more recent activities of the cultural industry which are dealt with in another chapter, have been more fortunate.

The initial difficulties encountered by musical development are understandable: tiny audiences and a lack of musical tradition; few concert halls or permanent, organized orchestras; in short, a lack of professionalization in the field. This was exacerbated by the ascendancy of first Italianate and later French fashions and the sway held by foreign concert virtuosi whose fame prevented local figures from emerging. In other words, although printing and literacy had somehow fostered the reading habit and created a new reading public of some size, these democratizing winds did not blow through the musical world until the middle of the twentieth century. Furthermore, the intermittent pioneering efforts were hindered by a dearth of musical scores and the critics' failure to understand the new trends. Official musical education and private music schools became strongholds of traditionalism, whether of the folkloric or Italianate variety.

However, after the 1920s, the academic approach began to break down for a number of reasons, such as the arrival of European immigrants and exiles; these events have not been properly studied. New reforming trends, such as the avant-garde movements, were then adopted and, as a reaction, cultural nationalism emerged. However indirectly, this fostered a sense of independence among artists which, in turn, created a new climate that eventually produced a number of composers and works of lasting value. These works are still included in the concert repertoire, appear in the record catalogues published in the Old World and are frequently broadcast by radio stations which specialize in this type of music. Luis Héctor Correa reminds us of this

when he points out that the *Encyclopedie de la Pléiade*, which specializes in music and appeared in 1963, did not have a single entry for Latin American music. This unpardonable omission is compounded by the fact that, as we are reminded by the same author, artists such as Heitor Villa-Lobos, Carlos Chávez, Silvestre Revueltas and many others already enjoyed international prestige and, at that time, their names appeared on concert programmes conducted almost always by Europeans who had chosen their compositions.

Parallel to this, a rich and original folklore was emerging whose roots were not solely Hispanic, as some scholars have tried to maintain, but authentic indigenous sources as well as the rich and highly significant contribution of so-called 'black music', i.e. the music of African origin brought by the millions of slaves uprooted from their homeland whose meagre luggage often included some musical instruments. These varied influences brought strength and complexity to existing forms of national music. Thus, the counterpoint between prestigious foreign musical expressions and the presence of new sources of inspiration and different native forms of expression was reinforced. A strong symbiosis occurred, giving rise to such composers as Heitor Villa-Lobos (1887–1959), whose robust works are distinguished by their characteristic rhythm and rich harmony. His *Choros* and numerous other works for piano, guitar, and orchestra as well as his choral works, are all performed to this day, showing that he had transcended the ordinary 'nationalism' of his roots and achieved a sophisticated synthesis where the nationalist component was interwoven with the influence of the avant-garde movements. His powerful inspiration allowed him to confront the already outmoded European rhetoric then in fashion. While nationalism is still apparent in the works of Mozart Camargo Guarnieri (1907–1993) and his followers, it is also clear that they had become trapped by their attempts to intermingle native themes with the trappings of a genre as alien as Italian opera. We are referring particularly to Carlos Gomes's (1836–1896) experiment *El guaraní*.

The tremendous influence of José Vasconcelos from his position at the Ministry of Education successfully encouraged all manner of cultural and artistic expression among the younger generations, which emerged in the heat of the Mexican Revolution. The evidence can be seen in music and the great murals. This dynamic, creative environment produced figures such as Carlos Chávez (1899–1978), who is well known for his *Sinfonía India* (1936) and *Xochipilli Macuilxóchitl* (1940). The latter work is performed using pre-Hispanic instruments. Chávez is the author of a vast repertoire covering every musical genre. He also conducted the Mexico City Symphony Orchestra (1928), and was the Director of the Conservatoire. This provided him with a privileged position in the musical world where he was regarded as a cultured and erudite artist. Silverio Revueltas (1899–1941), on the other hand, who is closer to popular tradition and whose works show social and political overtones, is remembered among other works for *Sensemayá* (1938). Although he died prematurely, his legacy remains in his brilliant compositions for the ballet. He was also an early exponent of music written specifically for a number of films. The works of both these composers were acclaimed not only for their powerful exoticism but also for their intrinsic worth.

At the other end of America we find Alberto Ginastera (1916–1983) who, according to José María Neves, 'is to

Argentina what Villa-Lobos is to Brazil'. His brilliant career as a composer should not overshadow his equally outstanding contribution as a teacher. He headed the Centro Latinoamericano de Altos Estudios Musicales del Instituto Di Tella, where he accorded great importance to experimental and electronic music; and, with the help of scholarships, many of the new generation of Latin American composers now emerging were trained under his influence.

Juan Carlos Paz (Argentinian, 1901–1972), an early exponent and defender of avant-garde musical movements, was a founding member of the Grupo Renovación (1930) and later the Agrupación Nueva Música (1937), taking part in their activities as a composer as well as a student and proponent of dodecaphonic and microtonal music. He also took an interest in concrete and electronic music. He has left a legacy of his pioneering work in a plethora of articles and books.

In Chile, the musical renewal is linked, as in other countries, to the appearance of certain institutions, such as the Bach Society (1917), the Orquesta Sinfónica (1926), the Conservatorio Nacional de Música (1928), the Facultad de Bellas Artes de la Universidad de Chile (1929) and later the National Ballet and Choir. These initiatives, which created a very stimulating climate that had a ripple effect, owe a great deal to the predominant role played by Domingo Santa Cruz Wilson.

Our overview of musical activity should not be limited to the examples mentioned above. Mention should also be made of the emergence of festivals, prizes, contests and the increased opportunities being offered by radio, records, and television as well as the development of outstanding performers, many of whom have taken Europe by storm. The list is long, so by way of example, we shall merely mention the Chilean Claudio Arrau.

The expressions of popular music, which impregnated 'serious' music, particularly in Brazil, deserve a chapter to themselves. Folk music, which became urbanized with the flow of migrants from the country to the city, where it sometimes underwent a profound transformation, attained admirable levels of artistic achievement. This is the case of Atahualpa Yupanqui (Argentinian), Violeta Parra (Chilean), Vinicius de Morães and Chico Buarque de Holanda (both Brazilian), who are known throughout the world. Another case, which is less exceptional than it might seem at first sight, is that of the tango, a dance form that has recently enjoyed great success in Japan. Among the innovators in that genre is Astor Piazzolla, a classically trained composer who, having been criticized and rejected by both camps, has finally gained complete acceptance.

**The visual arts**

With a very few exceptions, it may be said that the Latin American renewal in visual arts began with some outstanding expressions early in the twentieth century. Certainly the visual arts in their many manifestations did not require translation from Spanish and Portuguese. Paris in particular, and other European cities, were a strong attraction with their many schools and teachers, marchands and traditional welcome to artists, so that nearly every artist of note worked there at some time, and many stayed on. Contrary to what occurred with the boom mentioned in previous pages, which took more than fifty years to mature and required enormous

efforts to attain universality, the presence of painting on the world stage was felt very early on, for the aforementioned reasons and owing to the repercussions of Mexican muralism, which constituted a surprising phenomenon both on account of the originality of the works and because of their international renown. Here again we must mention the work of José Vasconcelos during his time at the Ministry of Education in Mexico. In his quest to assert national awareness, he sparked off creative energies. He sensed that the commotion unleashed by the Mexican Revolution would allow him to cast off the fetters of academism, Hispanicism, and costumbrismo and pursue an ambitious synthesis of all these trends, opening the flood gates to new audacities and exploring new uncharted waters where the streams of many different inheritances might flow together, renewed by the currents of the European avant-garde movements. All this took place in a climate of new appetites awakened by the social movements that created a new audience for less individualistic, less esoteric art forms i.e. art that was more 'popular' and accessible. It was the great painters, comparable in this respect to the titans of the Renaissance, who came up with the key. They used huge spaces to express themes of vital importance and their message was transmitted to that wide public. However, it is no coincidence that these artists, so closely identified with their homeland, had also absorbed the ideas of the avant-garde movements of the day in Paris. Their creations were the result of many influences coming together.

José Diego María Rivera (Mexican, 1886–1957), known simply as Diego Rivera in the annals of art history, met Juan Gris and Picasso in Europe at an early stage. He visited dozens of museums and was spellbound by the art of certain periods, particularly the murals by Giotto, Uccello, and Piero della Francesca. When he returned to Mexico he visited the Mayan ruins there, and in 1922, he was commissioned to paint the murals at the Escuela Nacional Preparatoria, a task that he combined with the organization of the Sindicato Revolucionario de Obreros, Técnicos y Plásticos. He rejected easel painting as elitist and defended public art on a grand scale on historical and indigenous themes as the national artistic expression. After that he painted huge works, the murals in the Secretariat for Public Education in Mexico City (1923–28), and the Palacio Nacional. Later he continued with his work in the United States. Rivera's stormy life never separated him from his art, which is remarkable for the quality and quantity of his output, the profusion of canvases, graphics and many controversial theoretical papers.

David Alfaro Siqueiros (1896–1974), who was even more categorical than Rivera, was personally involved in the political life of the Mexican Revolution and later in the Spanish Civil War. From his youth he supported the idea of 'art that synthesized universal themes, new forms and modern materials'. Imprisoned and later deported, he travelled throughout South America, where he left behind works, his teaching and disciples. His murals at the Escuela de Chillán (Chile), in Buenos Aires, and Havanaare are worth remembering. Of the great legacy of works he left to his country and the world of art, we might single out, not without some considerable hesitation, La marcha de la humanidad, painted in 1964.

José Clemente Orozco, another member of the trio representing this movement, painted at Pomona College in California (1930), the New School of Social Research in

New York (1930), the Baker Library at Dartmouth College, New Hampshire (1934), and the Great Hall at Guadalajara University. From his youth he also stood out as an extremely talented illustrator and draughtsman.

Apart from the intrinsic value of the three artists mentioned above, attention must be drawn to the significance of their work, which had an impact almost all over the world. They also had many imitators, though none of these ever attained the inner fire of their masters. Apart from these three, mention should also be made of Rufino Tamayo (1899–1991), an admirer of a less utilitarian and Dionysian aesthetic philosophy, though the influence of popular and folk art are apparent in his work. One of his murals decorates the walls of a conference room in the UNESCO Headquarters in Paris. Belonging to the same movement, but with undisguised differences, is the work of Juan O'Gorman (1905–1982) who, in his youth, was a forward-looking architect and author of the well-known mosaic mural in the Biblioteca Central at the Universidad Autónoma de México.

Frida Kahlo (1907–1954), Rivera's wife, was also an exceptional figure. Her strong personality, talent and strength allowed her to evade all the prevailing influences and tune in to surrealism, which she combined with painting of popular origin, freeing her imagination, which proved capable of creating lasting symbols, and composing her own unmistakable message. She captured her heroic life in a series of self-portraits, which are still among the most sought-after canvases of Latin American painting. Today her fame, which arrived late, is overwhelming.

Emilio Pettoruti (Argentinian, 1892–1972), who studied and worked in Europe for a long time, is regarded as one of the foremost figures of cubism. It certainly took some time before his art, which is refined and severe, attained the recognition it enjoys today, stirring up stormy controversies. A contributor to the magazine *Martín Fierro* (1924), where the spirit of Jorge Luis Borges already prevailed, he left behind an exemplary corpus of works, which is highly sought-after by collectors and museums alike. He also left his autobiography, *Un pintor frente al espejo*, where he tells the story of his human and artistic adventures in Europe and his relations – not always cordial – with the avant-garde movements, but its primary importance lies in the fact that it reveals the reaction of the critics and the public towards the new movements.

The influence of Xul Solar (Argentinian, 1887–1963) came later. He is a somewhat isolated figure in the world of Latin American art. His pictures, almost always small, are related to those of Paul Klee, Wassily Kandinsky, Kasimir Malevich. In the opinion of the critic Damián Bayón, he is an interesting painter because of 'the subtle and intricate fabric of (his pictures) from the point of view of the symbols he uses and his playful, surrealist type humour'.

Joaquín Torres Garcia (Uruguayan, 1874–1949) is undoubtedly one of the most original painters ever produced by America. When he was still young, he worked with Antoni in Spain. Later he took a great interest in prehistoric, particularly pre-Hispanic art, which had a lasting influence on all his later work. His style is known as 'constructive universalism', which is also the title of a voluminous and highly original book in which he expounds his theories. Every fragment of his vast work, part of which was lost in an unfortunate fire which broke out at an exhibition in São Paulo, expresses 'autobiographical, mathematical, metaphysical and spiritual concern'.

Another two Uruguayan painters who deserve mention are Pedro Figari (1861–1936), who fashioned an original style with his Creole market places, *candombes* and the presence of anonymous figures such as gauchos and blacks who animate his canvases. Over the years Figari, who mastered an exceptional palette, won the affection of thousands of admirers.

The vast fresco of Latin American painting is enriched by the valuable contributions of a number of noteworthy Brazilian artists. Although Tarsilia de Amaral (1886–1973), did not take part in the famous Semana de Arte Moderno, since she was in Europe at the time, she was influenced by it, as her anxiety to imbue modernism with a truly national character shows. She was also concerned to consolidate 'a new tropical Brazilian aesthetic philosophy, drawing its strength from the land and celebrating primitive things'.

Lasar Segall (Lithuania 1891–Brazil 1957) was trained in Europe but emigrated to Brazil in 1923. His work tended to reflect human suffering, ranging from the Jewish tragedies of the Old World to a moving vision of reality in his adopted country. However, he never ignored the countryside, which he depicted in a remarkably abstract vision.

Emiliano de Cavalcanti (1897–1976) played an active role in the movement engendered by the Semana de Arte Moderno before spending a long and productive period immersed in the European avant-garde movements. His spiritual development is interesting in view of his lasting interest in politics.

From a very early age, Cândido Torcuato Portinari (1903–1962) was attracted by the Mexican mural. Already in 1939 he was involved in the Ministry of Education building in Rio de Janeiro, designed by Le Corbusier. We shall mention only his frescos in the Library of Congress in Washington (1941–42), and in the United Nations building (1959). His lasting fame was consolidated by portraits and illustrations.

Wilfredo Lam (Cuban, 1902–1982), the son of an Asian father and a black mother, created his own 'pantheon of saints'. He is one of the foremost Latin American painters of all time on account of his highly original style, which was capable of combining the exuberant natural surroundings, recognition of African sources in the culture of his country, his fascination with primitive art and his sensitivity, which is enraptured and logical at one and the same time. *La jungla* (1943), a work inspired primarily by African sculpture and popular expressions of African art, is perhaps one of the highest points in the art of the New World. Lam managed to transpose 'the formal sources of Afro-West-Indian art and the evolution of religious beliefs, which form the basis of so much emotive and spiritual energy in Cuba'.

Among more recent figures, Roberto Sebastián Antonio Matta Echaurren (Chilean, 1911–2002) stands out. A highly original painter, his large-format works are full of abstract and monumental beings 'committing ritualized and bellicose acts', which give expression to a disturbing cosmic vision.

Jesús Rafael Soto (Venezuelan, 1923–2005) is the author of interesting experiments, such as his *penetrables* made up of metal tubes hanging so that the spectators will make them move as they come in. In 1970 he painted a mural for UNESCO.

The Colombian Fernando Botero (1932–) forged his own inimitable style very early on, and over the years he has consolidated it. His figures, particularly his human figures, animals and objects always appear bloated in his pictures

and sculptures, as though they have been blown up. They are enormously popular, and his works, which certain sectors of the public find very attractive, fetch high prices on the international markets.

Oswado Guayasamin (Ecuadorean, 1919–1999) is a prolific painter. He is remembered particularly for *La edad de la ira* (1959–62), which consists of 250 canvases similar to murals. Antonio Berni's (Argentinian, 1905–1981) two series of *collages*, *Juanito Laguna* and *Ramona Montiel*, constitute a harsh criticism of the society emerging around the vast conurbations. The prizes conferred by the Biennale di Venezia (1962) brought him deserved recognition.

All this art is a result of the greater cultural depth and maturity of Latin America, which, in turn, is indicative of its greater spiritual independence. The appearance of contests, galleries, competitions, biennial festivals, exhibitions, museums and schools which did not exist a century ago has undoubtedly played a part in this development, which, in turn, has led to an increase in the number of collectors as well as another interesting fact: although the traditional role of the state as a promoter of culture has decreased, new middle-class groups with less conventional taste have emerged alongside the high-income buyers of works of art.

## Architecture

In Latin America, where architecture was subject to the same influences as other cultural activities, the collapse of a cosmopolitan vision, particularly as a result of the serious socio-political events already mentioned, gave rise to a critical spirit and triggered off the search for new directions to follow. On the one hand there were trends bearing a Hispanic stamp, which sought to revive the colonial spirit, and others, which aimed to salvage indigenist elements or to combine both these trends. Two Argentinian architects stand out among those proposing the reworking of Hispanic and indigenist elements: Angel Guido (1896–1960), and Martín Noel (1888–1963). In the opinion of Ramón Gutiérrez, this movement culminated in the Argentinian Pavilion at the Seville World Fair (1929), and the Teatro Cervantes in Buenos Aires built in the same year. On the other hand, the most recent trends arising in the 'centres' were introduced in a mechanical and ingenuous way without adapting them to the new environment. This meant that building solutions designed for quite different climates were applied automatically in tropical and sub-tropical areas. In short, architectural journals and international congresses imposed their criteria, which were soon adopted. Although these trends almost always proved transitory, they often helped spoil the character of Latin American cities. This trend was reinforced by the presence of foreign architects, many of whom arrived among the great waves of immigrants, whereas others were commissioned to direct one-off projects, which were generally public buildings. To this must be added the widespread distribution of books containing plans and full blueprints, particularly of French and Italian origin, which were usually copied wholesale. Proof of this are the buildings still standing in the popular districts of every city which were built using these models. The fact that architecture schools and faculties came into existence late must also be taken into account. These schools and faculties were almost always offshoots of engineering

faculties and drew their inspiration from European or North American models, e.g. the prestigious Paris Ecole des Beaux-Arts. Construction materials, such as steel, glass and ceramic products, were introduced, displacing local or regional materials, such as the noble brick, which would be 'rediscovered' decades later.

This situation was aggravated by the destruction, in the name of modernity, of veritable architectural jewels inherited from centuries past, which had conferred a strong personality upon the urban landscape. Conditions were ripe for a debate on the nature of 'national architecture', which often strayed into truly eclectic mixtures, giving rise to a chaotic lack of style.

In his *Arquitectura urbana en Iberoamérica*, Ramón Gutiérrez points out a series of factors that illustrate the development of a clearer awareness of the problems existing within the Latin American context and identification of those buildings that are landmarks. Referring to the beginning of the twentieth century, he points out that the most important example of so-called art nouveau construction in the period, known in Mexico as the *Porfiriato*, was the Palacio de Bellas Artes, which was not completed until 1934, although the public competition was held in 1900. The main architectural principles were established by the Italian architect Adamo Boari.

Jumping a few stages and leaving to one side various styles and schools that were distinguished by the prevalence of ornamental elements used in the private construction of banks, ministries, hospitals, cinemas, hotels and cafés, it should be pointed out that certain socio-economic changes had by then restored the importance of the state. Other contributing factors were the synthesis of the characteristics of oligarchic and military governments, and fascist movements with their preference for monumental buildings. Reform movements had arisen earlier in a number of countries. It would be unjust not to mention the modernist movements in Brazil inspired by Mario de Andrade and Gregori Warchavchik, the movements inspired by the *Manifiesto Regionalista* (1926), of the thinker Gilberto Freyre and, above all, the changed intellectual climate.

Finally, the contributions made by the various Panamerican Architectural Congresses (Montevideo, 1920; Santiago, Chile, 1924; Buenos Aires, 1927; and Rio de Janeiro) should not be underestimated. At the latter congress it was recommended that each American nation aim to 'forge its own national architectural tradition'. To a certain extent the presence of one man in Latin America made a decisive contribution, precipitating change in the spirit of the architectural environment. We are referring, of course, to the two trips by Le Corbusier, who visited Rio de Janeiro and Buenos Aires in 1929 and 1936. In Rio he designed the now famous Ministry of Education building. Among other young Brazilians, Lucio Costa and Oscar Niemeyer worked alongside him. In Buenos Aires he drafted Planning Regulations, which for many years were the point of reference for future and frustrated plans. In both cities his lectures were fruitful, and the few buildings planned during his brief stays exemplary.

It is not generally known that at the time when skyscrapers were revered as the ultimate symbols of modernity, the highest buildings in the world were the Salvo Palace in Montevideo (1922–25) and the Kavanagh in Buenos Aires (1933–35). Both these buildings were constructed using

reinforced concrete, which was used because steel, the material traditionally used in this type of building, was in short supply and still not produced in Latin America.

While the large cities, such as Caracas, Mexico City, Rio de Janeiro, Buenos Aires and Bogotá, were mushrooming as a result of the great waves of migrants, more and more plans and blueprints for housing for the poor were produced, but the results were almost always unsatisfactory, even if the slow pace of building is ignored. There was vacillation, inexperience, political weakness and lack of organization among the poor, who did not have much lobbying capacity. These factors should not be considered in isolation from the climate of political instability, which was, and still is, one of the greatest problems and challenges facing Latin American society.

Of all the Mexican buildings, perhaps the most significant was the now famous Museo de Antropología e Historia (1964), designed by Pedro Ramírez Vázquez.

Another very influential public building was the *Ciudad Universitaria* in Caracas, where the great lecture hall houses Calder's paintings. This project was designed by architect Carlos Raúl Villanueva.

Owing to the magnitude of the undertaking, the greatest town planning and architectural project undertaken in Latin America during the twentieth century was the city of Brasilia, whose design reflects a long history with clear political and geopolitical overtones. It was built in response to the idea of constructing a new capital city far from the coast and looking towards the interior, which was isolated and largely unexplored. This new city would also help integrate into national life the vast expanse of millions of square kilometres suffering from the lack of modern communications and therefore condemned to isolation. They were not seeking a magic solution, but they did aim to mobilize the country to turn a myth into reality. One of the builders, Lucio Costa, writes that 'it was a deliberate act of possession, a gesture in the spirit of conquest typical of the cultural tradition'. Leaving the results to one side, recognition must be given to the clear-sighted courage of President Juscelino Kubitchek, who supported this colossal enterprise that later governments of all political hues were forced to continue. Controversy apart, Brasilia, a city that now has two million inhabitants, was based on the organic, holistic concept of two architectural geniuses, Lucio Costa and Oscar Niemeyer. The worldwide impact of this project and the subsequent renown of its creators meant that they were called upon to act as consultants and were commissioned to design cities, universities and public buildings in the United States, Africa and Asia. Latin American architecture thereby joined the vanguard of world architecture.

## EDUCATION

Despite all the obstacles arising as a result of economic change and the political crises that have hampered normal social development, education systems in general have expanded during the second half of the twentieth century. This tremendous expansion has been labelled a 'boom' because of the speed at which it occurred. For example, according to data for 1990 provided by UNESCO's *World Education Report 1993*,[5] gross schooling rates at every level and in every branch of education in Latin America are today above the world average. However, some clarification is required. The first qualification concerns the division into different levels. The second has to do with the enormous disparity between different countries and between the various regions within one country. Such is the case in Brazil, where there are great differences between one area and another owing to the vastness of the territory involved. A less significant point is the reliability and comparability of data. Another more eloquent illustration of this situation may be drawn from the estimates of Pablo Latapie, who analyses the growth of enrolments and school attendance rates between 1960 and 1989 in a report drafted by the International Commission on Education for the Twenty-first Century (the Delors Commission), and based on UNESCO data (*Statistical Yearbook*). The conclusions, expressed in thousands, are as follows: Enrolment in preschool education grew from 983 to 10,017 (growing 10.19 times); primary education expanded from 26,653 to 73,559 (2.75 times); secondary education increased from 4,085 to 21,251 (5.20 times) and higher education enrolment from 573 to 7,257 (12.65 times).

Apart from the demographic, economic, social and other data, which are well known and have been studied in depth, other factors may also shed some light on this phenomenon. One of these is the tradition, with its roots in the Enlightenment, which stresses the importance of education for 'progress'. This idea, which is well rooted in Latin America, was spread by the speeches of certain great politicians and educators in the nineteenth and early twentieth century. These figures were of the opinion that education had a decisive role to play in the process of nation building, which required citizens to be educated. They also believed that education was essential for economic progress, as training would produce workers capable of assimilating the new techniques and procedures arising from the Agricultural and Industrial Revolutions that were changing the face of the central countries, promoting diversification of production and a clear international division of work. Education was also important for 'social progress', promoting upward social mobility and exerting a moralizing or 'civilizing' effect upon behaviour and customs. In short, all kinds of moderating virtues conducive to change were attributed to education. These ideas, which were propounded by B. Juárez, D. F. Sarmiento, A. Bello, J. P. Valera and many others, sparked off a real enthusiasm for education, which took root at every level of society.

Certain countries, where the emerging middle class was taking shape and would be strengthened over time, could build education systems, which often gathered their own momentum, gradually reducing illiteracy and improving schooling rates. However, other countries with large marginalized rural and indigenous populations had to postpone these aspirations until more forceful proposals appeared which, like J. Vasconcelos in revolutionary Mexico in the 1920s, demanded more open cultural and education policies that would benefit the deprived *campesino* classes. Examples included Vasconcelos' 'cultural missions' or *casas del pueblo*. To achieve these aims, forceful and creative literacy campaigns were launched as well as other activities, which today would be classified as non-formal education.

Somewhat later, in Peru, the fruitful proposals of José Carlos Mariátegui in the field of education are worth mentioning, although the Peruvian experiment was limited

to the field of ideas, whereas Vasconcelos, as well as developing his ideas, also implemented them. In the formulation of his ideas, some of which are highly original, he rejected ideas of colonial stamp, which excluded the vast majority of the population of indigenous origin. He also engaged in discussions with the spokespersons of both the 'pragmatic' trends of North American origin and the 'humanistic' tendencies of European origin in order to draft a proposal for a national education scheme, which would include every ethnic and social group within a single school system. He proposed salvaging the pre-Hispanic tradition, upgrading it by modernizing it, and altering the regulations governing land ownership in force at the time. In his view, both these elements were essential if an alternative model were to be achieved which would be all embracing and democratic in a practical sense, promoting the participation of the underprivileged classes of Peru.

Education was regarded as a road to social advancement and prestige. The middle classes, which had developed considerably since the end of the nineteenth century and during the early years of the twentieth century, aided by the emerging trends of urbanization and industrialization, also tried to take full advantage of the fragmented opportunities offered by the system in a bid to breach the portals of the universities, which were the stronghold of the traditional classes. This process, which can be understood more clearly when we realize that it was accompanied by the growing popular movements, reached its zenith in the field of tertiary education with the University Reform implemented in Cordoba (Argentina) in 1918, which spread throughout Latin America at different speeds and with varying intensity depending on the regions. Its basic tenets were university autonomy, the participation of teachers and students in the government of academic institutions, academic freedom, periodic competitive examinations to select teaching personnel, as well as a regime known as 'free teaching', which allowed parallel chairs to exist side by side, broader student intake, free education, modernization of teaching practice, extramural university education, etc. These principles entailed redefining the role of the university, since the scope of these proposals outstripped that of merely turning out professionals, promoting scientific research and maintaining the need to contribute to the effective democratization of society. Such proposals revealed the political implications of the ideas contained in the University Reform and explains why it soon spread rapidly throughout most of Latin America. The spirit of the Reform inspired several generations of leaders, from Víctor Raúl Haya de la Torre to Fidel Castro. Though they were different in many respects, both from the theoretical point of view and in the practical implementation of their proposals, nearly all of them have openly recognized their debt to the University Reform. The struggle of both students and society at large to defend these conquests, which were undermined by authoritarian and military governments, lies at the heart of nearly all the student movements which, in the course of this century, have convulsed higher institutions. The 1968 disturbances in Mexico were among the most serious on account of their political repercussions. Student movements continue to call for more democracy.

It is a practical impossibility to review the ideas and achievements in the field of education on a step-by-step and country-by-country basis. We shall therefore take a leap in time to recall an initiative of outstanding importance, the 'Major Project on the Extension and Improvement of Primary Education in Latin America', which was approved by the General Conference of UNESCO that met in New Delhi in November–December 1956, and was introduced the following year. The results were noteworthy. The number of students rose from 21 million to nearly 32 million in the course of a decade, which means that enrolments grew at a rate of 5.1 per cent per year, when population growth was 2.8 per cent per year, and the number of teachers increased from just over 600,000 to almost a million. At the same time the number of schools increased, state education budgets improved and teacher training was stepped up. Until then, most teachers were untrained and lacked experience and incentives. At successive conferences, meetings and seminars the methods to be used were assessed and perfected, and the aims, which were linked to economic and social development, were defined more clearly. The notion of planning was introduced and statistical systems were improved. Although the aim of universal primary education was not achieved, this continues to be a primary aim, as was confirmed at the Mexico City Conference (1959), which put forward a proposal for total schooling for a period of 10 years by the year 2000.

From then onwards the work of international organizations, such as UNESCO, as well as other regional organizations, with the aid of national contributions, has grown in importance. The view that education is a necessity or an investment rather than a right, or which stresses the link between education and other factors contributing to 'human development', has gained ground. A valuable series of documents and books reflect some of the decisive points, such as the Project 'Development and Education for Latin America and the Caribbean', directed by Germán Rama and sponsored by UNESCO/ECLA/UNDP. The many thousands of pages that make up this document provide descriptions, diagnoses and proposals of great interest.

So as not to dwell too long on this point, we shall simply say that the conclusion of the World Conference on Education for All (Jomtien, Thailand, 1990) is a milestone in the history of education worldwide and is paramount for Latin America, where 155 countries undertook to provide education for all – including both children and adults – and to greatly reduce illiteracy before the year 2000.

Because of their importance, it should be remembered that UNESCO has also published two landmark works. In 1972, it published *Learning to Be* (known as the Faure Report), and twenty-five years later *Learning: The Treasure Within* (1996, known as the Delors Report).[6] The latter points out the most significant world trends: from the local community to world society; from social cohesion to democratic participation and from economic growth to human development. These trends form the basis of its proposal: learning to know, learning to do, learning to live together and learning to be.

We shall now take the liberty of going back in time to take a look at certain other data, which reveal the complexity of these processes.

More important perhaps than the ideas generated by the so-called 'development' movements, with their stress on efficient teaching and their concern for 'training human resources', were so-called 'freedom teaching' and a number of other 'de-schooling' movements that enjoyed some favour

during the 1960s and 1970s, though their influence has largely waned.

Paulo Freire (Brazilian, 1900–1987), the 'prophet of liberation teaching' exerted considerable influence all over Latin America and in Africa, not only through his numerous publications, which have been translated into several languages, but, above all, because of his enthusiastic personal mission which sometimes sparked off authoritarian reactions.

Of lesser significance is the 'de-schooling' movement, which left its mark in the region, where, in any case, it fired a critical spirit and gave rise to debate on many problems that had been neglected or ignored. Although the main exponents of this movement, Ivan Illich and Everett Reimer, were not Latin Americans, it was in Latin America that their ideas attained the greatest, albeit ephemeral, acceptance. The utopian, i.e. ahistorical, nature of their ideas made them less effective as tools in the real world.

At university level, among the many books published and the paucity of projects implemented, the University of Brasilia stands out. An original undertaking, whose characteristics cannot be analysed here, was conceived by Darcy Ribeiro, who is also the author – among many other books – of *La universidad latinoamericana*, which appeared in a number of editions and was translated into several languages, leaving its undeniable mark on a whole generation of educators and politicians. In passing it should be recalled that D. Ribeiro was invited to organize other universities in countries on different continents.

If the Latin American process is to be understood, the long dark years of civil and military dictatorships, which damaged the social fabric and consequently the education systems of most Latin American countries, cannot be ignored. The theories of these regimes were based on such ideas as 'the natural and eternal order', 'hierarchical structures', and 'traditionalism'. At certain times and in certain places, depending on circumstances, they assumed a technocratic hue, or adopted the trappings of economic liberalism devoid of political liberalism, or an outrageous form of social individualism. Being elitist, they were opposed to the expansion of the education system on account of its democratizing effects, and to qualitative change, pluralism, as well as participation in any shape or form. Any kind of educational modernization was suspect. They were also suspicious of the recommendations put forward by international or regional organizations, which they always regarded as tinged with 'Third World' assumptions.

Clearly, for countries whose main output was raw materials, where the population was overwhelmingly rural and change came but slowly, as it did in Latin America at the beginning of the century, primary education was regarded as sufficient and was synonymous with popular education. Generally speaking, primary, basic, elementary, common and popular all meant one and the same thing. When major changes occurred, bringing about an increase in secondary activities and above all in tertiary activities, as well as great migratory trends that gave rise to spontaneous urbanization, it became clear that this objective fell far short of what was required. Worse still, universal primary education had not yet been achieved. As a result, social demands became focused on secondary education, which also underwent profound change. Some explanation is required. Until that time, secondary schools had been regarded as a stepping-stone to the university, where the

traditional ruling classes were educated. It should also be remembered that university education was primarily a male preserve. In other words, the education system had to face the new challenge of an extraordinary increase in enrolment with huge numbers of women demanding access to higher education. This was accompanied by demands for the subjects on offer to be changed. The need for teacher training schools, as well as commercial, technical, industrial and agricultural colleges, was felt. However, before the system had managed to adjust to the new demands at secondary level, enrolments at tertiary level, particularly at universities, began to grow, because the rate of growth in the service sector outstripped that of industry. In recent years it has been shown that industry has not provided the number of jobs expected, partly on account of the introduction of technology and automated equipment that can increase both production and quality in less time. This has led to growing unemployment and frustration among the young.

The foregoing shows how, in Latin America, the whole education system is subject to strong internal tensions. This situation is aggravated when the role of the state is reduced, i.e. when economic resources are scarce and political decision-making is weak. Shrinking salaries and diminishing professional prestige are parallel phenomena.

At the same time, increased enrolments turned the elitist university into a university of the masses, which does not fit the mould of the old structures. Worse still, the university was increasingly oriented towards the training of professionals and was unable to meet the challenge of scientific and technological research, which later began to be transferred to a fourth educational level, that of postgraduate degrees, not always with satisfactory results, particularly as the objectives were not always clearly defined. Lying dormant in the growing number of degrees was the capacity to satisfy not only the 'explosion of knowledge', which is one of the characteristics of modern times, but also to satisfy the ever increasing demands of society. The state, for its part, gradually abandoned the virtual monopoly it had enjoyed in the field of university education in most Latin American countries and, along with it, its hitherto exclusive right to award university degrees for professional purposes. All these factors mean that, the university as an institution must rethink and redefine its role and functions if it is to respond to the challenges of the twenty-first century.

## Final thoughts

The spirit and objectives that have inspired these three sections are twofold. On the one hand, it was our aim to outline, however briefly, the cultural achievements of Latin America, which helped the continent to reach an awareness of itself as a distinct entity and forge its own personality. On the other hand, we wished to explore the significance and extent of these contributions in terms of universal culture. That is to say, we wished to explore in some depth the Latin American identity and its contribution towards the formation of a culture of truly human and planetary dimensions without ignoring, omitting or denying regional, national, local or minority cultures or forgetting 'popular' culture by concentrating too much on so-called 'high' cultures. In other words, it is our view that any culture that excludes local cultural expressions or other internal mixtures

or marginal cultures should be rejected, as should those cultures which attempt to seek refuge in impoverishing cosmopolitan visions.

However useful they may be in other contexts, in our view, data such as the number of television sets per thousand inhabitants, per capita consumption of newsprint or other such information, are an unsatisfactory gauge of true cultural development because they are simply inadequate. However, there is also something disturbing about the current trend. The division into periods, which we suggested at the beginning to facilitate understanding of cultural development in the long term, would seem to demand a fourth period that is not yet in sight. In view of the profound changes taking place the world over and, in the words of French historiographer Fernand Braudel, 'at every level of civilization' it would seem necessary and indeed urgent to surmount the previous stages. However, what we are seeing is a worrying decline in the spirit of this third phase: the critical and creative spirit is being lost, the distinct perception of the world is weakening and there is a regression towards the second phase, and even to the first. This is as a result of the overwhelming effect of a number of factors. However, we shall only single out the spread of the cultural industries and new media platforms that tend towards uniformity and, using formidable technological, economic and even political resources, impose models, values, fashions, trends and patterns that work against the development of local cultures, where even the local languages are often under threat. What we are witnessing is a formidable process of *exclusion* purporting to be *inclusive*.

As phenomena which bind peoples together, cultures must first and foremost respect their own unique characteristics if they are to enter a new, effective universal dimension that is something more than a variation of outmoded debilitating ethnocentric tendencies. In the Hegelian sense of ideas, overcoming does not mean denying, throwing out or concealing. On the contrary, it means salvaging on another level what had been rejected in order to raise it to new heights and imbue it with new meaning.

## AMERICA IN THE WIDER WORLD

America's presence in the wider world was already being felt from the time the Europeans set foot on its shores at the end of the fifteenth century. The nature of that presence has changed and grown until the present day. Now, in the second half of the twentieth century, that presence is truly universal and decisive.

Two milestones mark this development in the course of the twentieth century. The first is the First World War, when the United States of America entered the international stage as a world power and, at the same time, held sway throughout the American continent. The next milestone was the Second World War and the subsequent world scenario, where two great power blocs one led by the United States of America, faced up to one another. The outcome of this confrontation is that the new world order is dominated by a single protagonist, the United States of America. Therefore, it would not seem excessive to regard the twentieth century as the period when America consolidated its presence on the world stage.

## Old and new forms of economic and cultural integration

At the beginning of the twentieth century, three crucial events paved the way for and promoted the integration of America in the wider world. These were the great waves of immigrants from Europe, particularly to North America, the development of the oil industry and the massive industrialization of consumer goods, and the opening of the Panama Canal in 1914.

The participation of Canada and the United States of America in the First World War marked the beginning of a growing trend towards the displacement of the focus of what has been called the Atlantic civilization to the American continent. President Woodrow Wilson's efforts to promote the League of Nations were, however, followed by a period of isolation when the United States of America withdrew somewhat from the European stage. During this time the United States of America devoted its energies to consolidating its sway over the American continent. The imperialistic presence of the United States of America had begun at the end of the nineteenth century under the aegis of the Monroe Doctrine (1823), which was established to discourage Spain's plans for colonial reconquest and later to halt France's modern colonial advance in Mexico. When Spain finally lost its last colonial possession in America in 1898, the United States took advantage of the situation to legitimize repeated interventions of an imperialistic nature in Central America and the Caribbean. However, the great economic crisis of 1929 revealed just how important the role of America in the world economy was. The growing importance of America's presence in the wider world was aided in the field of literature by the appearance of the new North American novel, in the visual arts with the Mexican mural movement, in music with the arrival of jazz and later with the development of the cinema.

Canada and the United States played a major role in the Second World War and Mexico and Brazil a more minor one. This participation opened the door to the decisive presence of America in the world. North America provided direct support for the war effort of the allied democratic front against fascism, but indirect support was provided by Latin America through the supply of strategic raw materials. On the political front, too, support was forthcoming. The Atlantic Charter, signed in 1941 by Franklin Delano Roosevelt and Winston Churchill, marked the beginning of the definitive development of democracy in the world, which, together with the unstoppable trend towards decolonization, which followed the war, is the hallmark of the twentieth century. The creation of the United Nations in San Francisco in 1945, the democratization of Japan and the campaign for European reconstruction through the Marshall Plan (1948), consecrated America's predominant role on the world stage.

The onset of the confrontation known as the Cold War between the two blocs, which Winston Churchill declared inevitable at Fulton, Texas in 1946, the establishment of popular democratic regimes in central and eastern Europe and the triumph of the Chinese Revolution all contributed to the formation of two broad camps; their opposition to each other filled centre stage of the second half of the twentieth century, producing the longest, most deadly, diversified and widespread of the so-called world wars, where Korea and Viet Nam stand out in a whole series of

cruel colonial wars and prolonged guerrilla activity. America has not been absent from a single episode in this confrontation, whether through the open or covert action of the United States of America.

At the same time, Latin America's presence on the world stage has depended upon political events of varying significance and impact. The Mexican Revolution sparked off a considerable ideological debate, the most significant results of which were agrarianism and the industrialization of the oil industry in 1938, which set a precedent. The triumph of the Cuban Revolution in 1959, followed by guerrilla movements in a number of countries in Latin America, brought the confrontation between the two great blocs to American soil.

The fall of autocratic socialism and the resultant socio-political adjustment has laid the foundations for America's role on the world stage to grow still further and become more decisive, although the process of European unification and the development of economic and political power centres in Asia are posing a growing challenge. America is opening up new spheres of influence: in the economic order with the massive industrialization of the leisure industry, in the field of technology with space travel, information technology, electronics and genetic engineering. In the cultural sphere this is reflected in the development of art markets on the American continent and the creative boom in literature, the visual arts and music.

### Regional and international organizations

The creation of regional American organizations was due, above all, to the need to institutionalize the sway of the United States of America continent-wide, although it has also been useful as a means of finding recipes for peaceful coexistence between American states and of opening up important spheres of social and cultural cooperation. It is at the economic level that development of a regional order has proved slow and controversial.

Nowadays, the Organization of American States (OAS), set up in Bogotá in 1948, is a surrogate means of expressing the desire for unification first mooted in 1826, albeit in different terms, at the Congreso Anfictiónico called by Simón Bolívar and held in Panama. Constituted in 1889–90, through the formation of congresses of American States, which gave rise to the Panamerican Union, it is the oldest multi-state organization. Although not always compatible with the consolidation of national sovereignty and the development of democracy in Latin American countries, the OAS has played an important political role as well as promoting and coordinating huge aid programmes in the social, health and cultural spheres.

Other organizations, particularly those set up and developed as a result of the programme known as the Alliance for Progress, launched in 1961, have tried to respond, with varying degrees of success, to the aspirations of Latin American nations for social, economic and political development and to set relations between the United States of America and other states on a more equitable footing. The Latin American Free Trade Association (ALALC), the Inter-American Development Bank (BID) and the Latin American Economic System (SELA) bear witness to the efforts made in the economic and commercial sphere. On a wider political scale, but with important economic implications, the Pacto Andino, signed in 1969, CVARICOM, the Rio Group, MERCOSUR and the North American Free Trade Association are worthy of note. It should be stressed that in the course of the final decades of the century sub-regional agreements express the determination of Latin American countries to join forces in their attempt to find a fair and direct international voice. To this end such organizations have been negotiating with European and other international organizations.

In the world order, the Organization of Petroleum Exporting Countries (OPEC) must be mentioned on account of the profound and far-reaching impact it has had, as well as its truly worldwide nature. In September 1960, the Baghdad Pact was made public in Caracas. This saw the birth of OPEC, based on an idea put forward by Venezuela at the Pan-Arab Congress held in Cairo earlier that year. The producers of coffee, cocoa and bananas have played a considerable role in promoting the world organizations for the regulation of trade in these commodities.

In the sphere of politics and the armed forces, the foremost expression of the American presence in the world is the North Atlantic Treaty Organization (NATO), which was set up in 1949 and was the key to success in the confrontation with the Warsaw Pact.

### Place of Latin America in the new world order

Latin America's capacity to play a direct role in the new world order is still very limited. Those countries that play such a role do so as members of international, regular or specialized organizations and forums. However, in certain areas, such as social concerns, health and environmental issues, Latin America's participation has grown considerably, as occurred at the Rio Conference on the environment.

The survival in Latin America of a government which declares itself to be socialist emblematizes a kind of participation – marginal on account of its dimension – in one facet of the new world order, that of the demise of authoritarian socialism.

The re-establishment, or establishment in some cases and development in others, of democracy in Latin American countries constitutes a highly significant contribution to the widespread aspiration to achieve democracy throughout the world, particularly at a time when efforts are being made to reconvert the authoritarian socialist regimes.

Unfortunately, a new form of international crime has set up headquarters in Latin America. Nowadays, drug trafficking is a lucrative, illicit activity in which the more developed economies participate as excellent consumer markets as well as suppliers of the so-called upstream inputs and beneficiaries of the financial deals derived from this traffic.

### Ideologies and self-awareness – regional and national identity

Overall, it would be true to say that the primary significance of America in terms of ideology has been to develop and implement the broad lines of the socio-political course set in the nineteenth century, i.e. the practice of republicanism and the introduction of democracy, at both the political and social level.

No proof is required of the role of Canada and the United States of America in efforts to uphold these values throughout the world. Their participation in the great world confrontations is eloquent enough. However, Latin America has also made a not inconsiderable contribution to this struggle through its cooperation on the world front, although it is only right to stress that this contribution has been more demanding and significant on the home front.

The democratic vocation of Latin Americans, pulled hither and thither by anti-imperialism and dictatorship, has never ceased to seek its own form of expression. Their self-awareness, which they have always sought to enhance, has had to face up to imperialism, frequently in the shape of armed invasions but also in the guise of fascist-type nationalism and communist pseudo-internationalism. The emergence of movements such as the Popular American Revolutionary Alliance (APRA), founded by Víctor Raúl Haya de la Torre in 1924, Juan Domingo and Evita Perón's *Justicialismo*, and the attempt to Americanize Marxism represented by José Carlos Mariátegui, must be seen as efforts to find a 'Latin American way'.

America's unquestionable dedication to the promotion of democracy has been accompanied in Latin America by an on-going effort to strengthen regional and national identity. At the dawn of the twenty-first century, it would be true to say that awareness of an American identity does exist, but it is now based on the achievement of aims in the social, economic and cultural sphere and not primarily on the attainment and conservation of independence, as was the case during the preceding century. At the same time, Latin American regional awareness has been strengthened as national consciousness has developed. However, only a small number of Latin American states have even attempted to draft a new conceptual model that will allow the indigenous societies in their midst to express themselves freely in social, political and cultural terms. There are hopeful signs that this will change for the better in the early decades of the twenty-first century.

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# 33.2
## THE CARIBBEAN

*Hilary McDonald Beckles*

### THE CARIBBEAN AND MODERNITY

In the context of the discourse known as Western modernity, the Caribbean world was the primordial site for its principal ideological contests. Nowhere in the Western world were the contradictory forces of slavery and freedom, privilege and equity, racial domination and ethnic plurality, more keenly contested and openly ventilated. The Caribbean became the place where Enlightenment idealism and rationalism were aggressively pursued and deeply rooted in the harsh reality of a turbulent everyday life.

The script may have been written by the finest of European philosophers, and for a stage to be dominated by performers drawn from their own ethnic and cultural groups. But this expectation took a rather surprising twist. Instead, the stars of the stage were the enslaved Africans, the poor and dispossessed of the plantations, the wretched of the violated Earth, who seized the text, managed the moment, and delivered to a global audience the most revolutionary performance so far seen in the modern world.

The scene of the subversion and upsurge took its initial shape in the fifteenth century with the crime against humanity that chattel slavery represented. It matured with the most dramatic of performances; slaves became senators, chattels became citizens, and exchangeable property became elected presidents. There was no rendition of the script which cast the Caribbean as the site that witnessed humanity at its finest. Uprooting the evil of slavery and delivering upon the space a society dedicated to freedom, equality and justice was the role the Caribbean appropriated for itself. It gave its progeny a remit to remain faithful to this self-vision. The torn and tortured mandate has not been betrayed. The region has stayed the course and remains a site where humanity finds itself challenged to improve upon its best performance.

### The James-Williams paradigm

C. L. R. James's 1938 seminal text *The Black Jacobins*, and Eric Williams' 1944 tour de force, *Capitalism and Slavery*, tell the story of this Caribbean journey to justice. They constitute much more than foundation works in West Indian nationalist historiography. Both authors, born in colonial Trinidad and writing Caribbean history within its modern Atlantic context, made significant contributions to Western development discourse within the traditions of Enlightenment idealism. As critical realists they considered popular historiography indispensable to any attempt to locate philosophical ideals within recognizable terms of community living. In *The Black Jacobins*, James documents the struggles of the enslaved peoples of St. Dominique, the mercantile showpiece of French colonial capitalism in the West Indies, for freedom and social justice. In addition, he details the transformation of this successful anti-slavery rebellion into something much more elaborate in terms of Western history – the creation of Haiti, the Caribbean's first nation-state. In *Capitalism and Slavery*, Williams expands and develops the paradigm of African labour enslavement and European capital liberation, first outlined by James in *The Black Jacobins*, which became the basis of the revolutionary reorganization of productivity for European economic development.[1]

The James-Williams paradigm has had an extensive and discursive impact on thinking about the relationships between slavery, Western modernity and development discourse. In the Caribbean these works represent points of departure for studies in historiography, decolonization and the signal birth of an insider, Creole, nationalist canon. Both texts have received considerable criticism and enormous acclaim; they continue, half a century later, to stimulate the most expansive areas of Western historical writing. James's explicit intention was to locate the Caribbean politics of black freedom within the philosophies of European Enlightenment discourse. Williams's related concern was to illustrate the contradictory and paradoxical nature of modernist rationality as expressed in the economic and ideological effects of the application of the principles of political economy to the relationship between Caribbean slavery and European industrialism.[2]

Conceptually, *The Black Jacobins* and *Capitalism and Slavery* situate the Caribbean as the vortex of a wider Atlantic modernity that witnessed the interaction of Europe, Africa, and the Americas. For James, the politics of bringing Enlightenment ideas nearer to reality is seen as a mandate taken up by the enslaved against colonizers who sought to monopolize privilege and power. The Caribbean

in the aftermath of the Columbus enterprise is seen by Williams as culturally unique; *Capitalism and Slavery* is an economic study of Western modernity in action within the Caribbean space, while The *Black Jacobins* constitutes a statement of its exploding contradiction authored by subaltern people operating ideologically within the hegemonic philosophical paradigms of their oppressors.[3]

Columbus did not lie, as Caribbean culturalists and historians often assert. He 'did' discover the Caribbean. It was as real for him as any construction of knowledge within a specific cultural tradition could be. He believed that he had done so, and that Europeans would encounter a new and different environment within which they could collectively discover themselves as free individuals and citizens. Europe was liberated by the experience and its subjects became citizens while the colonized became natives. The conception and construction of the *Latifundia* and 'plantation', as the organizing principle of socio-economic life brought these worlds together. For the European they became a metaphor for renaissance economic rationality, civilizing modernity, and entrepreneurial freedom from the constraints of dehumanizing material poverty. The colonial mission, then, was a missile that launched the Caribbean, its European commanders and African cargoes, on the path to modernity on board the plantation enterprise that rose on the fumigated site of native ruins.

## Plantation culture

Caribbean plantation culture was in every respect symbolic of the signs of the times. Capitalist political economy found expression during the sixteenth and seventeenth centuries in a proliferation of mercantilist tracts on trade, finance, and manufacturing; their authors preached the values of large-scale production, surplus generation, and the accumulation of wealth through foreign trade. The plantation developed as evidence of institutional commitment to these principles, and in opposition to the traditional culture of peasant production, which was considered backward and ruinous to a modern nation. Large-scale production required extensive resource mobilization and strategic entrepreneurial planning. The Caribbean planter, therefore, was required to be global in both thought and action since productive resources were not readily available and had to be acquired from distant lands.

The Caribbean sugar planter of the mid-seventeenth century was celebrated as the most successful agricultural entrepreneur of modernity. This social type was also considered entirely unique and unprecedented in terms of the global scale of their operations. They were identified as icons of Europe's economic ascendancy and designated the leaders of Atlantic modernity. The global network that fed their business was truly impressive. Having pacified and, in some places, exterminated the resisting native populations, they resorted to importing servile indentured labour from 'back home' and enslaved labour from Africa. They produced crops with capital and credit from Europe, imported food and building materials from mainland colonies, and exported their commodities globally. Facilitated by a transcontinental complex of brokers, agents, and financiers, the West Indian sugar planter held the known world with his gaze and 'made good' with the extensive array of goods produced. Using their economic success to maximum effect, they lobbied and

bought their way into metropolitan parliaments and imperial courts in an effort to protect and promote the world they had made.[4]

The Caribbean plantation was also home to other contradictory processes of modernity. Industrial technology in its most advanced state could be found there in the form of the sugar mill. Described as a 'factory in the field' the Caribbean sugar mill was probably Europe's largest industrial complex in the sixteenth and seventeenth centuries. Its deployment of state of the art production systems, energy and chemical technologies, and a disciplined labour force, set it apart as something altogether innovative and futuristic. The manner in which agricultural and manufacturing processes were intertwined – field operations and the mill – also distinguished the plantation as a cutting edge organizational technology. It was all achieved, however, on the backs of enslaved, dehumanized persons. Labour systems founded on them carried titles such as *economienda*, debt peonage, chattel slavery, indentureship and apprenticeship. Free wageworkers constituted a very small minority, and were not institutionally encouraged. Slavery, in its many guises, was the expectation, and persons categorized as 'Indians' and 'Africans' or colonized others were targeted for life-long experiences with it.

European Enlightenment discourse, then, invented the Caribbean and promoted the idea that slavery was progressive and developmental for both parties to the power relation. That Caribbean modernity should begin an outbound journey with Admiral Columbus taking a 'sample' of island natives to Europe for sale and show, as a strategy to recuperate project expenditure, speaks to the way in which philosophy, economics, and morality came together as integrated systems of pro-imperialist knowledge. There was, therefore, nothing particularly phenomenal about John Locke, doyen of Enlightenment writers on civic freedom and human liberty, owning slaves and investing in Caribbean (Bahamas) plantations.

Locke's participation as an investor in the colonial project began with the Royal African Company, which, under the Restored Monarchy, was given a monopoly to supply enslaved Africans to the plantations in order to further the competitive interests of the English nation-state. There was nothing modern about Africans, Locke thought, which would entitle them to inclusion in discourse about the rights of individuals. Rather, he considered them savages to be enlightened and civilized by Europeans. Slavery for him, then, was a sort of beginners' school in which Africans would one day acquire the basic characteristics that would entitle them to membership in civic society.

The racist nature of pro-slavery ideology that emerged in the context of slavery's expansion throughout the hemisphere tore at the intellectual and moral coherence of Enlightenment thinking, and revealed it as ideologically driven knowledge constructed to serve what critic Edward Said calls the wider purpose of culturally preparing European nations, or the white 'race', for the age of imperialism. Williams' *Capitalism and Slavery* outlines the economic, or 'rational', reasons why slavery was preferred as the dominant labour institution by colonizers. But chattel slavery was more than a labour system; it was part of a political campaign to culturally differentiate the European from the rest of humanity and to establish representations of a self-serving ethnic pecking order for the enforcement of 'otherness' upon colonized peoples. Liberty, justice, and freedom would not be legislated as real objectives

for these categories of inhabitants who would be represented as outside the gaze of Enlightenment. Williams, furthermore, after mapping the financial circuits of wealth accumulation and money flows that made slavery viable, concluded that modern industrialism in Western Europe has its roots sunk deep in the veins of enslaved Africans.[5]

Western modernity, then, properly understood, should be viewed from the Caribbean with ambivalence. The writings of principal pro-slavery theorists reveal the reasons why such an argument can hold. Edward Long of Jamaica, writing at the end of the eighteenth century, considered it sufficiently important to seek conceptual reconciliation of the reality of African slavery and the idealism of European freedom within the context of the colony's status as the wealthiest within the English Empire. Africans, he said, were freer as slaves in the Caribbean than as subjects under tyrannical, unaccountable monarchs and chiefs in their homelands. Slavery, for him, was an institution within which Africans made real progress towards freedom; in addition, an added bonus was that they benefited from exposure to modern European culture and technologies. As a transitional state, then, slavery for Long offered Africans measurable long-term benefits, which made it ultimately a modernizing and progressive institution. These views were published, with discernible strategic nuances, by writers in other imperial systems such as Moreau de Saint-Méry and Hilliard d'Auberteuil in the French Antillean colonies.[6]

James's strategy in *The Black Jacobins*, was not to engage pro-slavery theorists on the internal composition of their arguments, nor to challenge the firmness of the ground on which they were ideologically situated, but to seek terms of inclusion through the adoption of universalisms. The notion of Enlightenment, he argued, had at best a temporal relationship to European culture. He recognized and embraced it as a process in human development with a history that flowed through several civilizations – including those of Africa. In this sense, its European moment was just that – a passage too short to be nativized and denied its essential multicultural ancestry and texture. It was, furthermore, a merger of historical ignorance and ethnic arrogance on the part of imperial Europeans who sought to show that the new conditions of social living were culturally linked to their nations.

It was understandable, James believed, that Enlightenment ideals found political agency in Western European societies at the moment of Caribbean adventurism. In these circumstances, however, they were severely compromised by the cultural needs of colonialism that centred around the promotion of Caribbean slavery as indispensable to Empire. History determined that it was incumbent upon the colonized subaltern, the enslaved of the Caribbean in the first instance, to claim as a right judicial and social access to this idealism, and to do so through collective opposition to imperial power. Only such politics, James showed, could constitute the resolution of modernity's contradictions, and best illustrate the transforming powers of Enlightenment in action. The subaltern included not only slaves – the black Jacobins – but also disenfranchised women, indigenous peoples, and other marginalized groups denied social justice by managers of the imperial project. The opposition vanguards so constituted, James believed, would ultimately bring home the true value of Enlightenment ideas and render obsolete the racism and sexism standing in the way of human progress.

## Revolutions

James chose the Haitian Revolution, 1791–1804, as the discursive device best suited to giving intellectual coherence and social reality to his argument. It was not surprising that enslaved blacks, and their free mixed-race allies in St. Dominique, took the anti-slavery revolt to the revolutionary stage by seizing the state and declaring national independence. St. Dominique was the most populous and financially attractive colony in the Caribbean at the end of the eighteenth century. The relationship between slavery and capitalism, as conceived by Williams, had combined to render the colony the golden crown of colonial success. At the same time, argued James the Marxist dialectician, anti-slavery consciousness among enslaved blacks and disgruntled mixed-race peoples, as well as their organizational skills, were highly developed. Anti-slavery mentalities with revolutionary commitment were being created at a rate in the colony that corresponded with its reputation as the producer of the most of everything in the Caribbean. Toussaint L'Ouverture, revolutionary leader and theoretician of Enlightenment praxis, appeared as the logical and inevitable consequence of a society so proud of its economic success.

But James did not end his analysis here; he went on to explain that inasmuch as slavery was a product of renaissance rationality, anti-slavery politics was the social effect of modernist idealism. No other figure in the Atlantic, he suggests, was as perfect an example of Enlightenment activism as Toussaint. The struggle in the colony for the liberty of man against the enormous weight of feudal backwardness and reactionary opinion constitutes the epic drama of the quest for Caribbean modernity. The Americans had gone to war against British colonial exploitation and won. Driven, they said, by the thirst for liberty, the philosophical idealism of their contest was compromised and betrayed by the decision to keep chattel slavery as the principal organizing social institution within the new, independent dispensation.

The American Revolution was tarnished and discredited by this unwillingness to declare the liberty of all persons. Citizens were forced by the inevitable maturing of the politics in which they were engaged to go back a century later to the battlefield in order to resolve the matter by one of the bloodiest civil wars in human history. French revolutionaries abolished slavery in 1794 and restored it a few years later because they could not see national interests being served better without it. The blacks of St. Dominique, then, were the first to declare the universality of liberty, which they built into the national constitution of Haiti, committing a state to eternal opposition to chattel slavery. Enlightenment idealism was rescued and historically legitimized by enslaved Caribbean people who were not expected to be its beneficiaries. Without Haiti as its principal expression, James would suggest, Enlightenment idealism would soon have been discredited as a ruling class philosophy serving limited self-interests.[7]

If James's concern was to illustrate Europe's and the Caribbean's conflicting philosophical passage within Western modernity, Williams' text was conceived as an articulation of slavery's changing relationship to economic rationality. Primitive capitalism, Williams showed, called Caribbean slavery into being as the main mechanism of Western wealth accumulation, while advanced capitalism,

driven by industrial and scientific technologies, banished it from whence it came, aided by the instrument of Parliamentary legislation acting within a context of moral and philosophical outrage. It was the triumph of the market, argued Williams, not the long-in-coming assistance of Enlightenment moral idealism that made legislated emancipation all the more magnificent and historically seminal. William Wilberforce, the (white) man of the moment, says Williams, should not be diminished within this materialist interpretation of history; rather, he should be accurately situated and understood as leader of a 'political' strategy that may have forestalled the production in the Caribbean of a thousand Toussaints.[8]

Emancipationism, in the form of European parliamentary politics, however, took nearly one hundred years to sweep the region – across imperial lines – clean of chattel slavery. The Spanish were the first to establish slavery and the last to relinquish it, a history according to James that accounts in great part for Cuba's dramatic entry into revolutionary socialism under Fidel Castro. Capitalist economic rationalization, as Williams argued, may well have been the hidden force behind the Parliamentary legislative anti-slavery strategy. The industrial and commercial maturation of capitalism was rather drawn out in the Spanish Empire and the economic history of slavery in its Caribbean colonies illustrates this all too well. Slavery was finally toppled by a largely Creole, politically complex opposition that featured prominently the slaves themselves, who went to great lengths, as anti-colonial anti-slavery revolutionaries, to win their liberty.

If the freeing of the 'lower' orders, as Cromwellian revolutionaries called the working classes, was a principal feature of the onset of modernity, the Caribbean 'slave' within Jamesian analysis was ahead of the times as a self-liberator. In the case of Haiti, slaves seized a state and moulded a world in accordance with their own ideological praxis. For James, a practical effect of plantation production was to advance the proletarianization of the enslaved worker. Outside the judicial process that defined them as slaves, the African worker was certainly the prototype of the modern industrial worker. Organized by a division of labour into discrete productive units, trained in a sophisticated way as skilled artisans (particularly in the case of the sugar refinery personnel), and as middle managers, plantation slaves contributed to a political discourse that promoted the democratic values of social justice and equality. In this way they ensured the social unacceptability of slavery as a fascist relationship of power, and centred Enlightenment ethos within popular culture.

The year 1804, rather than 1917, was for James the first fulfilment of this ethos. The rise of the Haitian State rather than the Soviet Republics constitutes that first moment in modernity when the alienated and dispossessed seized control of their destiny and emerged the subjects of a new world order. Haiti became the mirror within which Europe saw itself as the Janus – divided to the soul – of its own contradictory imperial experiment. The civilizing mission became the journey of a thousand atrocities that culminated in genocidal actions against natives that refused to give up their lands, liberties, and lives. When President Dessalines in 1804 named the new republic Haiti – reinstating the island's Arawakan language identity – it was an act of heroic self-denial that placed the struggle of Africans and mixed-race peoples in a secondary relation to that of those who had greeted the Columbus mission and were later sunk by its missiles. The year 1804, then, was at once a torpedo launch, and the inauguration of a new order in which it was demonstrated that the rights of man could be achieved through resistance from below by the disenfranchised.

## Literature

These movements for liberty were accompanied by a body of literature within which the enslaved spoke back and countered the ideological representations established within the texts of slave owners, and their authorized supporters. Slaves wrote memoirs, letters, and narrated their life-stories to collaborators in the anti-slavery struggles. This literature constitutes the canon of a Caribbean political philosophy. The memoirs of Mary Prince, the autobiographies of Esteban Montejo and Olaudah Equiano, and other such texts exposed the cosmologies of enslaved communities and situated individuals within the wide, elastic vanguard of anti-slavery consciousness and politics. Taken outside its immediate situation, this literature, in which the subaltern speaks, illuminates their socially uncompromised and intellectually honest attachment to Enlightenment idealism. A comparative reading of Locke on liberty and Mary Prince on freedom should expose the emptiness of Eurocentric race and class claims to textual authority, and validate James's belief that the speeches of Toussaint L'Ouverture were among the finest on the subject.[9]

But this literature by the enslaved goes some distance beyond its strategic engagement with Enlightenment philosophy. It constitutes the beginning of a post-coloniality in which African and Afro-Creole identities and ontologies are set out in subversive opposition to imperialism. Certainly, no post-colonial literary theory should emerge without a departure from this textual tradition that questions and rejects aspects of the European philosophical canon. Anti-slavery was undoubtedly an Atlantic movement, but the slaves, noted both Williams and James, were at the core of it. They were on the ground, developing resistance strategies as features of everyday life, and ultimately were the ones who implemented the first, and numerically the largest, act of emancipation. Furthermore, this early black literary tradition breaks with Enlightenment idealism on issues such as individualism, family, sex, ethnic and gender relations, religion and spirituality, perceptions of materialism, cultural difference, and the existence of universalisms.

## Identity politics

The demographic and cultural tendency towards hybridity and creolity, for example, that simultaneously divided and unified the social experiences of all persons within slave society stands ultimately as an oppositional movement to white supremacy ideologies as well as an early affirmation of inter-culturalisms that now challenge identity politics in the post-colonial world. The self-assault upon notions of racial 'purity' by managerial males of Empire whose exploitative sexual engagements with black women stands as a marked feature of colonial society indicates the public fragility, and private irrelevance, of the race theories that underlie European Enlightenment thinking. The size of mixed-race

populations can hardly be considered a reasonable measure of the extent of inter-racial sexuality. Rather, it should be seen as evidence of the failure to publicly suppress the private. Inevitably, the changing face of Caribbean society came forth to testify to the truth that colonialism lied. Hybridity was as much a subversive feature of the Caribbean's contradictory experience with modernity as any other, and may very well be an understated, if not negated, example of the 'Empire striking back' – even if, ironically, at itself.[10]

Freedom was demanded on all sides, but its meaning and social application in the hands of blacks went in directions radically different from those expected by European anti-slavery activists and thinkers. For this reason, English emancipation in action became a contested experience in which blacks had little reason to believe that 'massa day' was done. Post-slavery societies were politically charged with a protest culture that rendered them as unstable as their slavery antecedents. This can also be said of Haiti. Slave revolutionaries became petty peasants and disgruntled labourers within the nation-state and challenged the definition of freedom imposed by the military-landowning elite. They voted with their feet, undermined the productive capability of the economy, and forced the state to implement the 1826 Rural Code that sought to tie them to the land and penalized those who preferred unemployment or hillside squatting.

## Enlightenment and emancipation

Europeans and Africans, then, engaged Enlightenment discourse in similar and different ways. Differences were magnified by the challenges of post-slavery reconstruction. While Europeans could understand, and in some instances support, blacks' claims to social freedom, they could not agree that social justice required this freedom be rooted in conditions such as landownership, the political franchise, access to respectable professions, and involvement in large-scale mercantile activities. Blacks should be free to work for whites, they concluded, and be driven to do so by the threat of hunger and an unrelenting criminal justice system. European abolitionists, then, found it difficult to support blacks' demand for economic and political enfranchisement as articulated by their community leaders.

Meaningful land reform was out of the question. The plantation had to stay as symbolic and representative of economic globalization and white supremacy, and as a sentinel against Afro-centric peasant empowerment. Enlightenment, therefore, crashed on the rocks of the Emancipation it had supported in theory, and provided once again the philosophical basis of a repressive, authoritarian colonial political culture. The defence of the plantation as a civilizing strategy to ensure that the journey of modernity was advanced was articulated in the face of considerable black opposition to it as the principal institutional oppositional force to their realization of social freedom. The economic decline of Haiti was represented by whites as modernity in reversal. The peasant was backward looking and tied to Afrocentric culture. The plantation was progressive and tied to European culture. Haitianization for whites became the metaphor for the end of Enlightenment. Blacks maintained that in Haiti they were empowered, had capsized the European project, and were free despite their increasing material poverty. They were not going backward, but were charting a progressive new path for mankind.

These developments when taken collectively speak to the central paradigmatic feature of Caribbean modernity – the rise of the common citizen to institutional and cultural leadership. While the Haitian experience has no parallel in world history, the general Caribbean process that now sees the offspring of slaves in control of state apparati must be considered a principal expression of social freedom. That considerations of race affected adversely the ways in which European radicals received Haitian leadership in the early years, and that Caribbean societies continue today to be torn and tortured by ethnic conflict, should help to reinforce the argument that by turning the world upside down, Caribbean people found themselves having to cope with post-modern issues while still attached firmly to the modernist paradigm. Indications of this contradictory motion can be found in the personalities and preferences of both James and Williams, distinguished humanist 'Western' intellectuals (read 'English') but ideologically steeped in an anti-colonial milieu that forced them to be deconstructionist and post-modernist at a time when it was not fashionable.

James considered himself justified in the opinion that the Caribbean was not only at the heart of the 'West', but that the 'West' was invented in the Caribbean. Williams agreed, but recognized as James did that being situated in the 'South' of this 'West' meant that different forms of knowledge had to be constructed in order to function strategically. The challenge for Caribbean intellectuals, therefore, had long been to destabilize and deconstruct hegemonic notions of the 'West' in order to define the Caribbean as a 'southernized' Western project with its peculiar oppositional politics and identity. These strategic intellectual positions did not always win favour with radical political opinion. As a result many Caribbean people have gone for a sterile Columbus-bashing approach. They argue that the Columbus mission was traumatic, and had a profound but backward moral impact upon the modern Atlantic world; such persons have failed to grasp the significance of the invisible cargoes that Columbus carried; but this is where the analysis should begin, argued Williams and James.

On board, Williams tells us, were several unseen commodities: an economic ideology which was not yet labelled nor understood, but which came to be understood as something called commercial capitalism; the ideology of racism, which at that time was not clearly articulated, but which rooted itself in the Caribbean; the social ideology of patriarchy, which assumed the superior political and intellectual capacity of men over women; an intolerant Christian theology which defined other religions as primitive subtypes; an expansionist imperialist consciousness that focused on total territorial acquisition; and a rationalist philosophy that promoted the notion of materialism as the way forward for mankind. All of these things represented what the Caribbean voyage was all about. Columbus was not only a courageous sailor; he was a leader, an emissary of a new epoch; the flag bearer of market forces that had become endemic to European social culture, and of a civilization which was beginning to sail out of centuries of decay and stagnation and finding its identity within the context of an imperialist experience in the Caribbean.

Commercial capitalism signalled the beginning of the integration of the continents of the world into one economic system. It was in the Caribbean vortex of the Atlantic Basin that this international capitalism took its early cultural and social identity. Historians on both sides of the Atlantic have documented very carefully the impact of the slave trade and slavery upon world trade. They now know, for example, exactly how it called into being African resources, and the ways in which they were deployed upon the foundation of Amerindian genocide. Much of the discussion that is taking place in the Caribbean today about cultural identity, race, sovereignty and the fragmented processes of nation-building is all part of this legacy.

It is important to comment on the ideology of racism. For centuries prior to the Caribbean connection, it was rare to find within the literatures of Europe a systematic theoretical formulation of a white over black ideology. Slavery, of course, had preceded Atlantic colonialism, but the notion of black inferiority was not popular. Indeed, many of the slave systems of pre-Columbian Europe and the Mediterranean were based on a multiracial understanding of labour organization. As a result, therefore, most ethnicities experienced some degree of enslavement to others. In the enslaved labour gangs working on the estates, vineyards, and in the mines of southern Europe, many ethnicities could be found. It was after the Caribbean mission that slavery developed specific racial dimensions, and anti-black ideologies became culturally established within Europe. By the mid-sixteenth century it was widely represented in European texts that blacks were suited for subordinate slave relationships within the colonial order.

The association of materialist expansion with human progress in Enlightenment discourse reinforced commitment to this ideological development. It was accepted by colonial whites that the march towards economic development required the systematic enslavement of blacks. There was a clearly formulated view that it was necessary, morally legitimate, not only to enslave persons, but also to exterminate conquered people in an attempt to confiscate lands. The plantations had to be productive, and the mines had to go deeper; these objectives required land and servile labour. It was not possible to organize a free labour force in the war zones of the Caribbean. In addition, it was the belief and experience of Europeans that colonial frontiers were best developed and restructured by slave labour. The Caribbean, therefore, was constructed at the centre of a new philosophical and economic order. It was the theatre where a new dispensation took shape and first matured.

The principle of political economy that international trade was the surest way to achieve self-sustained economic development was articulated by advocates of colonialism in the seventeenth century who promoted the critical role of the Caribbean plantation system in wealth creation. What Williams demonstrated was that without the Caribbean's role in the colonial complex there would have been no eighteenth-century English industrial revolutions; and no English imperial ascendancy in the nineteenth century. C. L. R. James went further and developed the concept that West Indian people now represent, because of that history, a unique cultural type. Within the Caribbean new mentalities and identities were created: a new people who represent a melange of European, African, Amerindian and Asian ancestry. Almost every major civilization in the world was brought to the Caribbean in order to sustain the conditions for colonial economic growth. The West Indian, therefore, is a futuristic individual, linked to all major civilizations. West Indians are the first products of the modern world system.

When James's concept of the West Indian is placed alongside Williams' thesis showing how the Caribbean slave plantation complex generated wealth and created financial institutions for the modern world economic order, then it becomes necessary to look at the cultural role of race and colour within contemporary market economies. People of European ancestry continue to dominate resource ownership in Caribbean societies despite their loss of political leadership. In this regard, Columbus still sails! The Western white world did to Cuba in the twentieth century what it did to Haiti in the nineteenth; imposition of an international commercial blockade, refusal to grant financial assistance, and general economic sabotage. No modern nation can now survive without international connections. To understand the electoral defeat of Michael Manley's Jamaican socialism, the cannibalization of the Grenadian Revolution, and attempts to cripple the Cuban Revolution requires first a study of the history of the Haitian Revolution. The region has gone through all this before. There is nothing new about it.

## CONCLUSION

The Caribbean, then, has had a turbulent and divisive experience with Western modernity. Contests have been waged with Enlightenment discourse. Political, intellectual and cultural work in the region demonstrates this. One of the more important intellectuals of the Caribbean who stood at the crossroads of these polemics was J. J. Thomas, also a Trinidadian. By the 1860s and 1870s, Thomas was a formidable oppositional writer, political ideologue, and philosopher. He spent many years explaining and rebutting the racist Enlightenment opinions of nineteenth-century English intellectuals such as Anthony Froude and Thomas Carlyle. Froude had visited the Caribbean after emancipation, and on his return to England wrote a book in which he said that an injustice was done to black people when granted emancipation because they were culturally regressing, spending their days eating pumpkins and sleeping under coconut trees. He was supported by Carlyle, who argued in an essay entitled 'On the Nigger Question' that emancipation represented a retreat from the principles of progress and that the future of the region was bleak. Thomas exposed the race, class, and gender contradictions of European Enlightenment discourse, and spoke in defiance on the specific and unique features of a discrete Caribbean modernity.[11]

Tensions and contest with Caribbean modernity in turn could not be contained within the islands. They breached the walls of the insulating Caribbean Sea and began a journey to energize liberation struggles in those same places from which it had drawn ancestral populations. Garveyism emerged as a Pan-African paradigm which maintained that European modernity in all its forms must be resisted and defeated at all costs: philosophically in the academies, in the market relations of the economy, in culture and the arts. The challenge to oppressed people to mobilize against racism and Empire was taken up, and

Garveyism spread like 'wild fire' throughout the colonized communities, with over five hundred branches in North and South America, and Africa, in addition to hundreds in the Caribbean. Having embraced the Caribbean, Garveyism went global representing the voice of Africans and all racially exploited people. Euro-American elites sought to contain Garvey in much the same way that the Haitian missile was contained. It was absolutely necessary from the point of view of those who claimed representation of the Columbus voyage to ensure that Marcus Garvey's Black Star Liner did not sail.

The contest of Caribbean modernity continued. The Cuban Revolution, which consolidated the region's socialist cosmology, linked its own specific struggles with those of colonized people on the other side of the Atlantic. In much the same way that Trinidadians George Padmore and C. L. R. James were critical ideologues and activists in the liberation of Ghana, Cuban troops made possible the driving out of imperial Portuguese and racist South African armed forces from Angola, and the subsequent winning of independence for Namibia. In these dialectical ways Caribbean modernity, though fractured, torn and tortured, came to participate in the political liberation of African people.[12]

Despite the pervasiveness of these struggles, and the successes of the independence movement of the post-war era, there remain people in the Caribbean trapped in colonial relationships. They are powerless with respect to resource ownership and their economies cannot independently sustain adequate levels of material living. George Lamming, however, has consistently made the wider point – with respect to the empty formality of constitutionally independent nation-states – that those who govern don't rule. Ethnic minorities who have recently arrived, and those who inherited the mantle of a restructured slave mode of production, are still very much in control of the economic destiny of the region. The historical forces of continuity and change suggest that the overlap of modernity in crisis with post-modern discourses are creating in the region new conceptual frontiers for theoretical analysis. While one group of citizens celebrate 'Discovery day' and another 'Emancipation day' the past continues to dwell in the present and the resultant turbulence produces the enormous energy sources that define and propel the Cultural Revolution that is the Caribbean.[13]

## NOTES

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# 34

## WEST ASIA AND THE ARAB WORLD

*Anouar Abdel-Malek,* coordinator

## INTRODUCTION

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In the present chapter on society and culture in West Asia and the Arab World, we will endeavour to examine the reality behind the turmoil of conflicts. The history of our contemporary world reveals a persistent pattern of conflict culminating in the twentieth century's two world wars, the Cold War and its aftermath, the rising tide of national liberation in opposition to imperialism, and, since 1991, the rise of globalism and hegemony. Simultaneously, resurgences in key areas, mainly in the eastern region of the Middle East, are opening new paths of development (Map 15).

This is an area of encounters and confrontations where the three monotheistic faiths have co-existed for thirteen centuries. Moreover, it is the focal point of invasions and confrontations between two of these faiths, and the region in which the three major religions are expected to converge. Until the 1990s, the ideological divide between the two

*Map 15* **The Arab world**
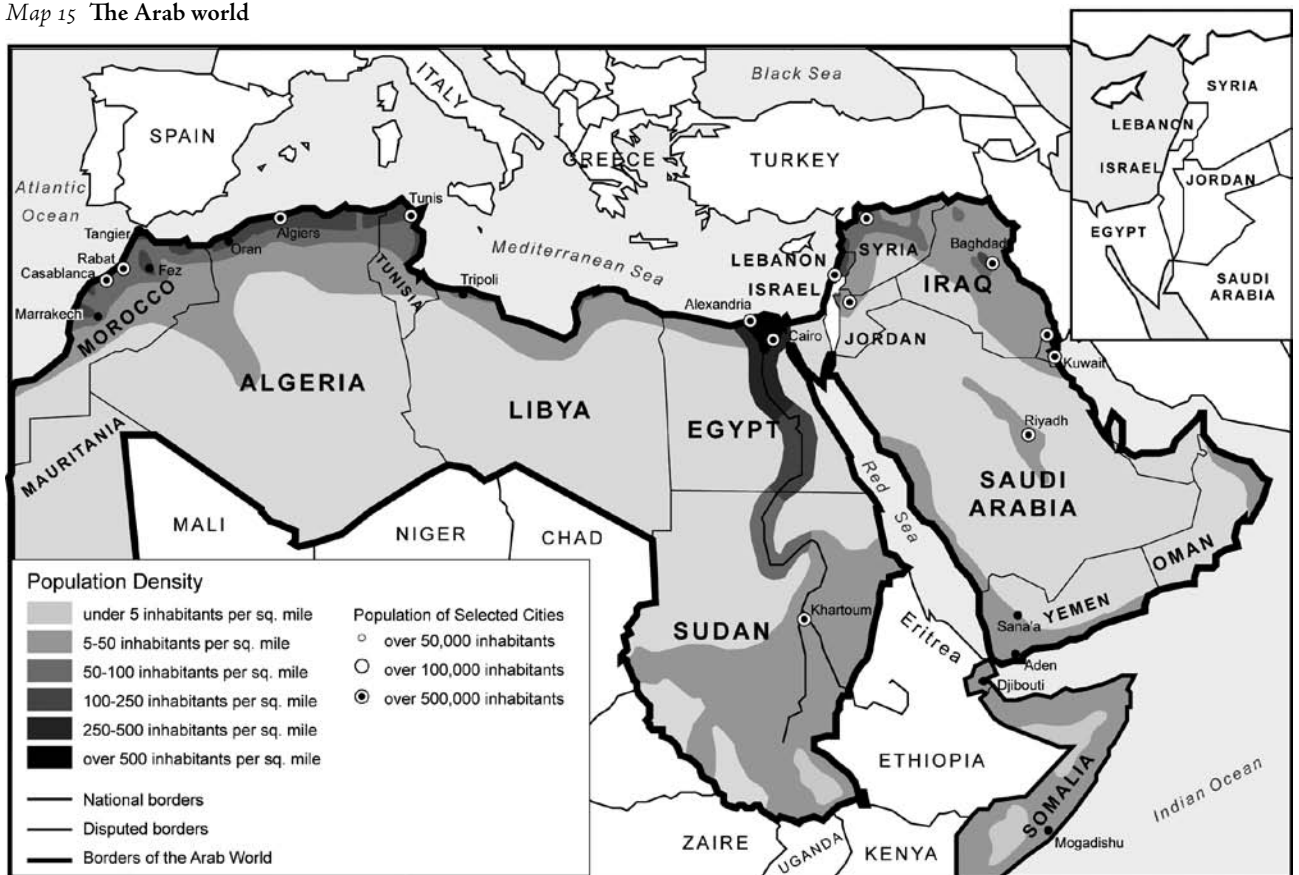


Adapted from M. C. Hudson, 1977, *Arab Politics: The Search for Legitimacy*, Yale University Press, New Haven, CT.

major economic and political world systems resulted in a race for allies in the region. To this day, the region remains the object of colonialism and imperialism, as the principal European powers, and more recently, the United States, have striven to control this strategic zone.

This explains the strained evolution of contemporary societies and cultures in the Middle East, now engulfed in the complex processes of globalization, which is rendered even more complex and acute by the region's immense oil and gas reserves. In this context, many specialists recognize the important, yet uneven, achievements in both infrastructure and production, which testify to the determination of all the societies under study to concentrate on the fundamental issues. Those persistent major efforts bear witness to the vitality and resilience of Middle Eastern societies, in spite of the mounting tide of pressures and threats, often exacerbated by the lack of adequate resources.

These efforts and achievements have more often than not attempted to replicate the institutions and processes of the advanced Western countries. Among the many contradictions are the conflict between the two types of evolution of the societies under review. The imitation of the more advanced Western societies has long been accepted as the dominant orientation. Such imitation has taken various forms: from the mere replication of institutions, values and processes of the advanced West, magnified by the impact of mass media, notably television, to the assimilation of the achievements of the more advanced societies. During an initial stage, imitation prevailed, particularly when decadence was rightly perceived as resulting mainly from the hegemony of the advanced West over the Middle Eastern societies. Imitation was thus accepted as the only logical choice of the new elites eager to join the ranks of modernity and expecting to be accepted as disciples and junior partners.

The second orientation in the societies under review proceeded from the constraints and failures of the first orientation. Gradually this became the prevailing perception among the rising national middle classes, divided by their recognition of their distinctive national cultures and the challenges of modernity. Hence the rise of endogeneity in the modernization and renaissance processes. Yet the deepening impact of globalization and hegemony can only increase the assertiveness of the members of Middle Eastern societies. Thus the stage was set for the dialectics between imitation and endogenous creativity at the heart of the socio-cultural processes of Western Asia and the Arab World.

# 34.1
## IRAN (ISLAMIC REPUBLIC OF)

### *Ali G. Dizboni*

The Islamic Republic of Iran is currently undergoing far-reaching social and cultural change that may be unique in the Muslim world. The reform movement symbolized by the 1997 presidential elections is the outcome of a lengthy transition from tradition to modernity. The twentieth century witnessed major political upheaval: from the establishment of the Pahlavi nationalist monarchy (1925–79) to the foundation of the Islamic republic (1979), which has for some years now been grappling with a powerful reform movement.

Historically, the cultural and scientific development of Iran has always been closely tied to political developments. Under both the monarchist and Islamic regimes, the development model has been characterized by the state's desire for radical societal change. Despite the quantative growth in development indicators, modernization and Islamization have had disparate effects and have failed to remodel the society or heal the wounds of transition.

As Boissel has noted, during the reign of the last Pahlavi Shah (1941–79), culture remained the exclusive privilege of the royal regime: 'Everything related to conservation, production and distribution of the arts (music, theatre, film, painting, crafts and audio-visual technology) received government patronage through the highly active and powerful Ministry of Arts and Culture, established in 1964, which has since been under the authority of a member of the royal family'.[1]

Culture was therefore managed by centralized national institutions. Firstly, the Society for the Development of National Music, which later became the National Music Conservatory of Tehran, was founded in 1945, and it was followed in the 1960s by the first National School of Fine Arts, the State Institute of Decorative Arts and the Higher School of Television and Cinema.[2]

The film industry, which dates back to the 1966–77 period, was strongly influenced by foreign productions (especially from the US). During this period, only 76 films were produced nationally, while 500 were imported. Production of the first films of international standard began in 1972 with films that often addressed social and economic issues.[3] After a post-revolutionary break of a few years, the Iranian film industry took off at the end of the 1980s, when it became remarkably successful and earned an excellent reputation on the international scene, winning a record-breaking 300 prizes[4] at international festivals.

In Iran, during the 1990s, there was a relative and fragile liberalization of culture, including the written press. The end of the Iran-Iraq war (1980–88), the American embargo and the challenges of economic reconstruction have, together with other factors, revealed signs of weakness in the religious regime. This is true to the extent that there was a ruthless struggle between conservatives and reformists, whom some have called post-Islamists.[5] The struggle resulted from the gap between the vision and capacity of the Islamist political model and the expectations of the population, 70 per cent of which were under 30 years of age. Intellectually, post-Islamism was defined by a thorough revision of Khomeinist ideology and objection to the conservatives' monopoly. The electoral programme of religious intellectuals, including President Khatami, took up the language of civil society and such issues as sovereignty of the people, limitations on judicial powers and on the prerogatives of the Leader of the Revolution, and finally, freedom of expression.

The press played a key role in the 1997 presidential elections by rallying public opinion to the reformist candidate, Khatami. The number of journals and newspapers peaked from 830 in 1997 to 1,491 in 1998. However, since 2000, when a major crackdown on the press began, 80 of them have been closed down for 'press crimes'.[6] Of the 50 periodicals forced to cease their activities in 2001, only two have been allowed to resume publication. In addition, in the summer of 1999, the campus of Tehran University was the scene of the Iranian 'Tiananmen', savagely repressed by pro-regime militia forces.[7]

In 1998, censorship on other fields of cultural production was lifted, at least temporarily. The number of titles of books published reached 20,642, and of public libraries 1,304 (with a total collection of 9,605,508 books). There were 307 theatres, with 2,068 drama performances, and 173,060 cinema screens showing 60 films per year.[8] However, supply fell far short of the great demand. Several public television channels have been opened but do not cover the whole country, nor do they satisfy the diversity of demand. UNESCO statistics for 1996–97 show that there were 263 radio sets and 71 television sets per 1,000 inhabitants.[9] The use of satellite dishes is therefore becoming very widespread, especially in the big cities.

In the field of education, the illiteracy rate, which was approximately 80 per cent in 1962,[10] fell to 16 per cent for

men and 26.5 per cent for women in 2003, a remarkable success considering that the population in 2003 was 70 million compared with 33 million in 1979.[11]

Under the Pahlavi regime, as part of the reform package known as the White Revolution (1962), the state introduced a national system of compulsory, secular education in the Persian language, without gender discrimination, which was free of charge even at the pre-university and university levels. The Literacy Corps, made up of 47,000 young graduates of pre-university schools, became the new spearhead bringing literacy to rural regions. The programme was moreover copied by the clerical regime in the 1980s and renamed the *jihad savad amouzi* (literacy jihad), covering some 2,192 adult education schools.

However, religious schools run by the Shiite clergy, which had been tolerated and sometimes suppressed by the Shah's secular regime, have become very prosperous and widespread under the mullahs. Their diplomas are being increasingly recognized by the ministry in charge of higher education.

In the 1980s, the university education system was heavily purged following the outbreak of the Cultural Revolution (April 1980 to autumn 1983) supervised by the Supreme Council of the Cultural Revolution. The clerical regime then decided to close all 200 institutions of higher education in order to remodel the academic structure and impose a single university curriculum. Secularization thus gave way to Islamization designed to eliminate Western influences. The imposition of the *hijab*, the establishment of Islamic Student Associations and changes in school textbooks exemplify this new policy. The regime centralized academic administration under the Ministry of Culture and Higher Education.[12] Admission to university programmes is governed by 'ideological and moral' selection procedures.

An important development has been the emergence of private universities (*Danechgahe azade eslami*). These universities, often of inferior quality and designed for young people, which were founded in 1981 in an attempt to offset the insufficient capacities of public universities, have spread throughout the country. In 1993–94, such universities existed in 80 towns. The number of students enrolled in 2001 accounted for 40 per cent of the total of 1.45 million university enrolments.[13] After the private universities had been set up, Payame Noor University (a distance learning university) was established in 1987 by the Supreme Council of the Cultural Revolution and placed under the ministry in charge of higher education. These programmes are overseen mainly by primary-school teachers and civil servants.

The 12-year structure of pre-university education, based on the French system, has remained unchanged but school textbooks have been revised to meet the requirements of the Islamic regime. Emphasis has been placed on the teaching of Arabic, *lingua islamica*, as a second language. In the 1993/1994 academic year, 17,552,092 pupils were enrolled in 96,474 schools, which included 445 technical schools, 524 commercial and vocational schools and 73 agricultural schools. The Ministry of Education publishes 747 different school textbooks, totalling 100 million copies, each year.[14]

The brain drain remains a chronic problem. Until 1970, owing to the dearth of postgraduate university courses available locally, especially in engineering, students were forced to go to Europe or the United States. In 1976, there were 60,000 students abroad and 154,000 in the country,

70 per cent of whom were men. In addition, in 1978 there were 10,000 Iranian doctors abroad (almost the same number as in Iran). Iran needed at least 50,000 doctors to provide basic medical services, but there were only 750 medical graduates between 1980 and 1986.[15]

Beginning in 1983, the regime's scientific and industrial policy aimed to improve the situation by providing more postgraduate programmes through the expansion of public universities in the provinces and the opening of the private universities mentioned above.[16]

Few accurate statistical data are available on the state of scientific and technological development in Iran. During the reign of the Shah, royal patronage was extended to the science and industry sectors, especially strategic products (oil and gas). Foreign investment was allowed and the assembly industry became the model for technological development.[17] Above all, in the petrochemicals and nuclear fields, the huge oil boom of the 1970s led to massive projects that were not completed after 1979 and the Islamic Revolution. According to the British magazine the *Economist*,[18] 60 per cent of the Iranian economy is controlled by the Islamic government and 10 per cent to 20 per cent by semi-governmental foundations (*bonyad*).

Industry recovered only after the Iran-Iraq war in the 1990s. The energy (exploration and rehabilitation of production capacity) and military sectors remained at the top of the list of industrial projects. Development of the petrochemical industry was still the best option for diversifying export. The National Petrochemical Company worked with foreign firms and investors, and in 1998 it grew by 25 per cent, that is 10.5 million tonnes of petrochemical products.

According to analysts,[19] Iran 'now has all in all a highly diversified, quality industrial base (automobile, household appliances, chemicals, textiles, pharmaceuticals, and construction materials) which cannot, however, meet the country's needs or produce for export'.

The Ministry of Science, Research and Technology, successor to the Ministry of Culture and Higher Education, is officially in charge of the R&D sector through two affiliated institutions: the National Research Council (Shoraye Pajoohesh Keshvar) and the Organization of Scientific and Technological Research (Sazamen Pajoohesh-haye Elmi va Sanati). In fact, other ministries (such as Defence, and Health, Hygiene and Medical Education) and other semi-governmental foundations have their own scientific and technological research institutes. For instance, in addition to university research centres there are other bodies such as the Institut Pasteur and the National Bio-Informatics Network.[20] The fragmentary nature of the research centres, overlapping and the lack of coordination under a national scientific development strategy are impediments to the optimization of financial and human resources.

Although pure sciences and engineering account for 50 per cent of enrolments in public and private universities, the Ministry of Science, Research and Technology recently deplored the state of advanced research. It emphasized weaknesses, such as: the living conditions of teachers; lack of dynamism in universities; the need to optimize information and communication technologies, and increase investment in scientific development; and the lack of an organic link between industry, the financial sector and the management of universities, due, among other things, to

the highly theoretical nature of university curricula.[21] This appraisal is confirmed by a United Nations report which states that in 1996 there were 0.7 scientists per 1,000 inhabitants and that 0.48 per cent of GDP was devoted to R&D.[22]

It is evident that it is neither prudent nor easy to make a definitive assessment of the cultural and scientific development of The Islamic Republic of Iran. The ambivalence of the political situation and the paradoxes of transition mean that there is reason to be methodologically pessimistic. On the other hand, the positive trend, at least with regard to the quantitative growth in certain cultural indicators, calls for measured optimism on our part.

## NOTES

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# 34.2
## TURKEY

# 34.2.1
## TRANSFORMATIONS IN THE FIRST HALF OF THE 20ᵀᴴ CENTURY

### *Sina Akşin*

The Ottoman Empire, insistently called 'Turkey' by Europeans, was a well-organized structure based on the principle of ethnic and religious coexistence. Its weakness was its basically feudal character. Capitalism could find little room for development and the Turkish bourgeois class was almost non-existent. The Turks were late in adopting the printing press, which only appeared in 1729. Mosque schools, followed by the medrese, were archaic and almost entirely religion-oriented. To a large extent situated on European soil, the Empire had to modernize if it was to continue to exist. The seeds of this indispensable revolution were sown by the establishment, during the reign of Mahmut II (1808-1839), of modern schools of higher learning. These were, to start with, the School of Medicine (1827) and the Military School (1834). As the number of their students and graduates grew, they secretly organized to form the Committee of Union and Progress (CUP, 1889), composed of civilians and military officers.

### THE CONSTITUTIONAL REVOLUTION AND ITS COUNTERREVOLUTION

Thanks to the military officers who were graduates of the Military School, and were also mostly members of the CUP, this organization was able to force the Sultan to apply the Constitution and order elections (1908). It is noteworthy that this development was parallel to similar events in Russia, Iran and China. Following the absolutism of Abdulhamit II (1876-1909), the revolution generated an explosion of relief and enthusiasm. The CUP had great ambitions. The Empire was to be modernized and in the process 'the sick man of Europe' was to be cured. At first Europe seemed to receive the revolution very favourably, but as time passed it developed a great aversion to the CUP.

The CUP retained a varying degree of power up until 1918. During these years revolutionary changes were instituted:
1. The legal infrastructure (laws and regulations) of a modern state was created.
2. With the abolition of censorship, a large amount of new publications – periodicals and books – appeared. Thanks to freedom of expression and the predominance of educated people, the content of educational programmes and books was much improved. Intellectual and political currents such as nationalism, Westernism, Islamism and socialism flourished.
3. As a result of new legislation and active encouragement from the CUP, capitalism began to develop.
4. There was a remarkable increase in funds allocated for education, which produced important advances.
5. This period also marked the beginning of the emancipation of Muslim women, with greater opportunities for education and work.

In 1914, the CUP government chose to join the First World War on the side of Germany and Austria-Hungary. The result was defeat, which discredited the CUP. The Unionists abolished their organization and the leaders fled the country. Vahdettin, who became Sultan in 1918, thought that with the disappearance of the CUP, he could stage a counterrevolution and revert to absolutism. Parliament was dismissed, and Vahdettin tried to curry favour with the victorious British. But Britain, supported by France and Italy, tried to impose the Sèvres Peace Treaty (1920) which not only dismembered the Empire, but disregarded the principle of self-determination, bringing the Ottoman Empire to the verge of extinction. This produced a reaction and the movement led by Mustafa Kemal began a struggle for national independence and constitutionalism. Constitutionalism materialized in the form of the convocation of the Grand National Assembly in Ankara. With due encouragement from the Allies, Vahdettin thereupon initiated a civil war against the Kemalists but was defeated. This was followed by the defeat of the Greek Army, which at one point had advanced up to Ankara. This military achievement enabled Turkey to make a very favourable peace treaty at Lausanne (1923) and gave Mustafa Kemal, as commander-in-chief, the necessary prestige and authority to conduct the Kemalist Revolution.

### THE KEMALIST REVOLUTION

The Kemalist Revolution was the result of the 'Sèvres trauma'. In order that Turkey never again face another Sèvres, the Turkish people were to become as developed as the Europeans – in the economic field as well as in the fields

of education, culture and science. The idea was that development should take place in every conceivable field (e.g. music, production of electricity, football and railroads). The philosophy behind this concept of wholesale, integral development was to be that of enlightenment, so that an end could be put to medieval practices and behaviour. The Kemalist Revolution was much more radical than the Constitutional Revolution, being republican and secular (the Republic was proclaimed in 1923 and the principle of secularism was written into the constitution in 1937).

A striking reform of the Kemalist Revolution was the alphabet reform (1928). The Arabic script had been adopted during the conversion of the Turks to Islam in Central Asia, and had been in use ever since. Now the Latin alphabet, with certain modifications and additions, was to be used. What made this reform possible was the fact that the literacy rate, which was 5 per cent in 1918, had by this time increased to only 10.7 per cent. Another reform was the language reform. In the Ottoman Empire the written language was so laden with Arabic and Persian words that the uneducated (notably women) could not understand it. Discouraging the use of such words and encouraging the use of Turkish equivalents, and creating new words when such equivalents were not available, became a campaign in the 1930s. The Turkification of the language (including the finding of equivalents for Western words) is an ongoing process. Thus, Turkish has been so transformed that the written language of the Empire is now called Ottoman to differentiate it from present-day Turkish.

The People's Houses and Rooms were a vital institution of the revolution. Mustafa Kemal decided in 1931 that the best cure for reactionary movements and obscurantism was culture. People's Houses were cultural centres active in nine areas, including the arts, sports, libraries, educational courses, lectures and social work. A total of 478 of these centres were created, together with People's Rooms which had a more limited scope, but numbered 4322. In 1933 Istanbul University was also reformed, unfortunately accompanied by the exclusion of about two thirds of its academics who were considered inadequate. At this time Hitler's regime was busy ridding itself of academics who were Jewish or otherwise in disagreement with the Nazi ideology. Of these, 142 were invited to Turkey, where almost all of them served until the end of the Second World War. They were first-rate academics and the level of development of present-day universities owes a great deal to their efforts.

The education of peasants was a great problem, owing particularly to financial destitution, lack of communications and the isolation of many villages. Before the death (in 1938) of Mustafa Kemal, who had become known as Atatürk, an almost miraculous solution was found. Boys and girls from villages were to be educated in Village Institutions (21 of them) as teachers, technicians and cultured persons and then sent back to their villages. This solution solved the problem of adaptation to difficult village conditions and communication with the peasants. It was also very cost-effective, since those children built their own Institutes and grew their own food. The revolution, unlike fascist or fundamentalist ideology, also attached great importance to the equality of the sexes. The emergence of the first professional women – lawyers, doctors, pilots, diplomats, MPs – was greeted with great celebrations.

In 1945 President İsmet İnönü (1884-1973), who succeeded Atatürk, decided to inaugurate the multi-party system. In 1950, his party lost the elections, and the new government reversed some of the reforms introduced by its predecessor. For instance, the People's Houses and Rooms were closed down in 1951, and the Village Institutes in 1954. However, these changes had limited effects, progress continued in many fields and economic development was broadly unaffected.

# 34.2.2

## DEVELOPMENTS IN THE SECOND HALF OF THE 20ᵀᴴ CENTURY

### *Timour Muhidine*

Turkey's geographical situation has determined its history, particularly its cultural history. The country's position in the geopolitical landscape changed in the period after the Second World War. Its Arab neighbours experienced rapid change because of the windfall from oil and the pan-Arab movement centred in Egypt, while the common border with the communist Balkans was a constant source of tension. But Turkey managed to assert itself as a hub of movement and trade in the 1980s: many conflicts within the country (guerrilla warfare in the East) and elsewhere (Chechnya, the Caucasus and the Gulf War) had a great impact on internal political developments and gave fresh impetus to its foreign policy ambitions. If the issues of oil and gas exploitation and the water reserves in southern Anatolia are also taken into account, then a shift may be seen to have occurred in the pattern of regional alliances: Central Asia (neglected until Prime Minister Turgut Özal came to power) became a central focus of attention, and agreements were implemented with Israel, a strategic ally. Thus Turkey once again took up a key position in the regional 'great game' confirming the break with the Arab world that dates back to the years of the First World War: most economic and cultural exchanges were conducted with non-bordering countries.

### A DISTINCTIVE IDENTITY

The distinctiveness of the Turkish model is perhaps best seen in certain historical and cultural aspects. Turkey retains a keen awareness of its imperial heritage, and this awareness has been heightened since 1990. Its position as a multicultural and multi-denominational state continues to fuel nostalgia and also feeds into – or offsets – the model of a modernizing secular state that it maintained until the mid-1960s.

Another aspect, which has mainly attracted the attention of sociologists, is Turkey's high mobility, both nationally and internationally (trade and emigration, particularly to Western Europe). This might be called a taste for nomadism rooted in the imagination of a nation that sees itself as continuing a 'long march' towards the West.

After a period in which the oral popular culture, often linked to mystic orders (the Bektashis, in particular), was rehabilitated (and, in more than one case, rediscovered), what

might be called the second stage of republican cultural life has begun, with the reappraisal of the Ottoman period, including both its zenith (the fifteenth and sixteenth centuries) and decline (the late nineteenth century), times of great creativity that gave rise to a host of political and linguistic projects. One of the major incentives was no doubt the opening of the Ottoman archives to researchers and the general preference for a more prestigious past than that of the Republic. A shift occurred from the cult of a martial system centred on the East (around the new capital, Ankara) to acceptance of the many cultures tolerated by the Empire. This no doubt accounts for the abundance of publications and research on social, linguistic, artistic and economic aspects of the period when the *millet* (nations) lived side by side. Interest in this period – over and above the antiquarian aspect – makes it possible to put things into perspective, assigning them their place in history as a means of achieving reconciliation.

The widening gap between urban and rural cultures became more pronounced in the 1970s: with the shift from a mainly rural country to one that was primarily urban, habits and language changed; the rural heritage in terms of customs, attitudes to health and food, the very idea of travel inside the country changed completely. The folkloric features of art also diminished considerably, and this may be regarded as mirroring a decline in the nationalism which had threatened to isolate the country.

### INTELLECTUAL AND ARTISTIC MOVEMENTS

The major world intellectual movements, especially Marxism and existentialism, gathered many followers in Turkey. Nevertheless, the question of what constituted a Turkish intellectual was debated mainly within the 'Anatolian' school, which stressed the cultural continuity between the land of Anatolia – considered in terms of its ancient heritage – and contemporary Turkey. The intellectual, Sabahattin Eyüboglu (1908–73), for example, defined himself in relation to Western classical culture – the humanities – and contemporary works rather than in relation to the Orient, whether Arab or Persian.

These trends were most strongly reflected in literature; the number of poetic works produced has increased in the

course of the century, and several writers continued to enrich contemporary Turkish poetry: Nazim Hikmet (1902–1963), Fazil Hüsnü Daglarca (b. 1914) and Melih Cevdet Anday (1915–2002). In the novel, best represented by Yashar Kemal (b. 1922), Turkish prose succeeded in portraying two major developments in the country's history: rural change followed by rural exodus and the emergence of a new urban Turk. In the arts, architecture and music held pride of place; painting often fell into line with major international trends, and attempts to reinterpret the traditional arts (naïf engravings, miniatures) were not very successful.

## SCIENCE, TECHNOLOGY AND EDUCATION

Rooted in a strong tradition of medical and Earth science education, scientific research expanded considerably only after the early 1980s. Governed by five-year development plans, research gained a higher profile owing to the large number of reports and congresses of TÜBITAK (Turkey's Scientific Research Foundation, founded in 1963), which were indicative of the progress and aspirations of a country dependent on Western science but nonetheless determined to control its own national development. The recent availability of works aimed at the public at large and of several scientific journals is an important sign of change in the general culture of a population that is by and large not scientifically inclined.

In telecommunications, Turkey has taken up the challenge of television programming: many of its broadcasts are transmitted to its neighbours and the countries of Central Asia. Similarly, in the field of education, Turkey exports an educational model (textbooks, radio and television programmes) to Turkic-language-speaking countries, asserting the influence of its secular republican model geared to a Muslim population.

Education made rapid strides when the Village Institutes were established in 1941, but that scheme was unfortunately halted in the mid-1950s. Since the 1980s, the strong support for education has found expression in the establishment of many state and private universities (Bilkent, the first private university opened its doors in 1984).

With the extension of the university network, the human sciences have also expanded considerably, as illustrated by the extensive translation and research projects in the fields of history, sociology and philosophy. What may also be regarded as a delayed effect of the structuralist wave has led to renewed creativity in the field of thought: the brilliant school of historians working on Ottoman archives, and the philosophers who have been won over to logic theories (Nusret Hizir) and Husserlian phenomenology (Nermi Uygur) are emblematic of a living culture.

In conclusion, we should note the emergence of a psychoanalytical trend of thought in Istanbul, drawing on the French tradition and on the practice of psychiatric hospitals established in Turkey since the beginning of the twentieth century. This is no doubt a clear sign that the individual is receiving greater consideration in a society in which the group has long had priority.

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# 34.3
# AFGHANISTAN

*Roland Gilles*

Hemmed in between Iran, India and the steppes of Central Asia, with no outlet to the sea, Afghanistan was one of the poorest countries in the world at the end of the First World War. And yet it enjoyed some prestige in the international arena. It had been neither occupied by Britain nor annexed by Russia. Bounded together by their faith and their resistance to foreign influence, the Afghans shared a strong sense of historical identity, even though they were far from founding a nation. Their country, apparently unscathed by any form of colonial rule, was seen as a 'Citadel of Islam' at a time when the Ottoman Empire was collapsing, the sultanates of Central Asia were under the sway of Moscow and the Arab Middle East was under the protectorate of the Allies.

Its independence must, however, be put into perspective. Since the second Anglo-Afghan war, in which the British gained the upper hand (Treaty of Gandomak, 1879), Afghanistan had no longer been free to conduct its own foreign policy. The Great Powers had drawn its borders as a buffer state between Russia and British India (Mortimer Durand line, 1893). Change was brought about by Amir Abdurahman (1893–1901), who unified the country by clamping down on the Afghan tribes, including the Pashtun. Without breaking ties with Britain, he laid the foundations of centralized government in Kabul. He can thus be seen as the 'father' of modern Afghanistan.

His son Habibullah Khan, who succeeded him in 1901, maintained the agreements concluded with the British and embarked on a process of economic development. On the educational front, higher education establishments were founded to educate the future Afghan elite. Habibiyia College was opened in Kabul in 1903, followed by a teacher-training college and a military academy. Reformist and nationalist ideas championed by Mahmud Beg Tarzi and his newspaper *Seraj-ul-Akhbar* were well received by the amir. These ideas, very much inspired by those of Jamâl al-Dîn al-Afghani, claimed that Muslims should seek in their religion – since it advocated the quest for knowledge – the principles and forms of a new approach to modernization, distinct from the materialistic and atheist approach of the West.

## KING AMANULLAH AND THE BREAKDOWN OF THE NATION-STATE

In February 1919, Habibullah was assassinated under mysterious circumstances. One of his sons, Prince Amanullah, seized power. He broke off the agreements with Britain and launched raids on several Indian border posts. This marked the beginning of the third brief Anglo-Afghan war. The British, weary of these perpetual conflicts, signed the Treaty of Rawalpindi, which gave the Afghans ample latitude to conduct their own foreign policy. According to the terms of the treaty, the Afghans were to be granted full independence in 1921. Two years later, Afghanistan was endowed with its first constitution, which bore the imprint of Mahmud Beg Tarzi: all Afghans, whether Muslim or not, had equal rights and were citizens of the state. The idea was clearly to replace the old tribal bonds and the *umah*, the religious community, by allegiance to the constitution.

In 1926, Amanullah, now on the throne, undertook a grand tour abroad. On his return to his kingdom, he stepped up the pace of the reforms, especially in education. Primary education was made compulsory for boys and girls alike. Afghanistan was on its way to becoming a kind of modernist nation-state on the model of Mustafa Kemal's Turkey or Reza Shah's Iran. But although technical modernization was accepted without difficulty by Afghan society, modernity caused resentment. The peasantry resisted the social reforms imposed by the king, particularly the ban on the veil for women and schooling for girls. At the end of 1928, revolt broke out. Insurgents led by a fanatical Tajik, Bacha Saqao ('son of the water-carrier'), captured Kabul in 1929. Amanullah fled to Qandahar, then abdicated. He died in exile in Italy in 1961. This episode demonstrated the obstacles encountered by the concept of nation-state when applied to a conservative peasantry divided by geography, origin and language.

## DIVERSITY OF ETHNIC GROUPS AND LANGUAGES, AND MIGRATORY MOVEMENTS

Some 17 ethnic groups, speaking as many languages, have settled on the lands making up Afghanistan. The country is divided into five major groups: the Pashtuns, the Tajiks, the Asian Turkic groups (Turkmen, Uzbeks and Kyrgyz), the Hazara and the Baluch.

The Pashtuns, who are Sunni Muslims, make up 39 per cent of the population. Traditionally farmers and warriors, they inhabit the regions extending from Jalalabad to Farah.

They regard themselves as the quintessential Afghans, since the dynastic state was originally formed by a Pashtun ancestor of the Abdali tribe, Ahmad Shah Durrani, who was crowned king in Qandahar in 1747. Enjoying preferential treatment from the authorities, they settled in the west (Khurasan and Badghis), the centre and the north.

The Tajiks, who are Persians of Central Asia, speak Dari or 'court language', a form of Farsi with an Afghan pronunciation that has become the language of administration and trade. It is in Dari that Afghans read the Persian literary classics, the poems of Rudaki, Firdusi and Hafez (consulted in the way the Romans consulted Virgil) and the works of their great national writers, Ansari, Jami and Sanai. The members of the ruling class, even those of Pashtun origin, tend to speak Dari, which remains the language of culture. The Tajiks, most of them small farmers, settled mainly in the west and north-east (Badakhshan and the Panjshir Valley).

The Hazara, of Mongol origin, are believed to have arrived in Afghanistan in the thirteenth century in the wake of Genghis Khan's armies, since the word *hazar* ('thousand' in Farsi) evokes a military unit. They gradually replaced the Tajik-Aimaq in the upper valley of the Helmand River and in the Bamiyan region. In 1893, their territory was conquered by Amir Abdurahman on the pretext that they were 'Twelver' Shiites. They speak the Dari of their Tajik neighbours and form a hierarchical tribal society with a considerable capacity for organization.

The Turkmen, from the Sultanate of Merv (Turkmenistan), settled the north of the country en masse around 1922, to escape the Soviet regime. They were mainly Ersari Turkmen living on the income from their herds. Tekke, Yomud and Chodor families have also married into their clans. In the course of the twentieth century, these nomadic herders became partly sedentary, moving into the towns of Meymaneh, Andkhoy, Aqcheh and Mazar-e Sharif.

The Uzbeks, who invaded Khurasan in the early sixteenth century, settled in small fiefdoms in the north of the country until they were subdued by Amir Abdurahman. Both nomad and sedentary communities spoke a language descended from Chaghatay Turki. In the north, Uzbeks who continued to herd sheep and horses lived in yurts and were referred to by the generic term *kuchi* (nomads). Among them, the Lakai are renowned for their great weaving skills.

The Turkic-speaking Kyrgyz lived mainly in the Pamirs (Wakhan). They were nomads living at an altitude of roughly 4,000 metres in high valleys only accessible in the summer. They raised sheep and yaks.

The Baluch, whose language belongs to the West Iranian group, occupied the far south-west, the Dasht-e Margo Desert and the south of Helmand and Qandahar provinces. Mostly nomads, they moved about with their herds in these regions, which were devastated and transformed into desert under Mongol rule. Large groups of Baluch settled around Herat and in the north of Afghanistan, becoming peasants and small-scale herders. The women made very beautiful rugs.

In addition to these major Persian- and Turkic-speaking groups, there were the Nuristanis, descended from a very ancient Aryan migration, who remained unaffected by Islam until their territory was conquered by Amir Abdurahman; the Kohistanis, who live in southern Nuristan; some Arabs gathered in villages in the north; the Brahui, herders who are

neighbours of the Baluch and who spoke a pre-Aryan Dravidian language, and lastly the mostly urban Jewish communities, such as those living in the Chaharsuq district of Herat who left Afghanistan during the Russo-Afghan war.

## AFGHAN SOCIETY

The population, whose numbers at the time of King Amanullah can only be guessed at, stood at roughly 15 million at the end of the 1970s. Its diversity was in clear contrast to the definition of a nation-state. More importantly, the population was 85 per cent rural, attached to its lands and traditions, with factors of cohesion – Islam, kinship, community and tribal links – that lay outside the sphere of the state.

Islam was the foundation of all authority, the supreme criterion for judging individuals who would be no more than a handful of dust (*khâk*) in the immensity of Creation if they did not fear their God. Religion therefore permeated all aspects of life: family life, eating and drinking, manners, work, travel and battle. Everything happened according to the will of God the most great (Allahu-Akbar), and by invoking his name. Men wore turbans, cut their nails and trimmed their beards in a certain way in order to follow the example of the prophet Muhammad.

Islam is not only a belief system, however: it is also a source of education, law and, to a certain extent, a political project. The boys of a village learned prayers, passages of the Qur'an and the hadith from the mullah – who was often the only literate person in the community – since even though Arabic is not in the same language family as Dari, both languages use the same alphabet. Shari'a, the set of laws derived from the Qur'an, was for most peasants a respected source of authority in addition to – or in conjunction with – older institutions: councils of elders, water regulation, and so on. In non-tribal areas where the honour code (Pashtunwali) was not applied, shari'a was the backbone of criminal law and customary law. For Afghan Sunnis, who were in the majority, this legal framework took the path of Hanafism. On the political level, Islam certainly encouraged the practice of consensus and community assent. This form of Islam, under the reign of Amanullah, was traditionalist, although not without a transcendental element, as attested by the attachment of large numbers of Afghans (from the middle classes and skilled craftworkers, among other) to Sufi brotherhoods: Naqshbandiyya, Qadiriyya and Chistiyya. It was the form of Islam then pervasive in Afghanistan and mostly untouched by fundamentalist doctrines, like that of the Muslim Brothers which emerged in Egypt in the 1920s, or the older doctrine of the Deobandis of India, which was to serve as a model for the Taliban.

It would be wrong to contrast categorically the tribalism of the Pashtuns with the absence of tribalism among the Tajiks. It is true that the pyramidal structure of Pashtun society was more marked, from the family unit, the *qawmi jirga*, run by the patriarch, to the assembly of all the tribes, the *loya jirga*. It was, however, an ideal structure, contradicted by the perpetually shifting alliances between small groups and the widespread practice of blood feuds. On the other hand, social constraints and aspirations were the same. *Zan, zar, zamin*: women, gold and land – the three main concerns of Pashtun khans were also those of the Tajik landowner, only the names were different.

Centuries-old conditioning kept women or *Zan* in a state of virtual seclusion. In the countryside, Afghan women carried out their work with their faces unveiled. In the cities, they would not dare go out without being hidden under a *chadri* (burka). Marriage, arranged by the families, was the subject of lengthy transactions. *Zar, zanim*: gold and land – the peasantry, barely making a living from the hostile land, expected a certain redistribution of wealth by the local powers.

In this discreetly hierarchical society, the individual felt obligations towards their relatives, their professional environment (*qawm*), the regional chief and the mullah. A whole system of mutual obligations underpinned the society, which was not feudal in the medieval sense of the term as there was no oath of allegiance, or indivisible hereditary fiefdoms, but which operated on the basis of extensive clientelism accepted by all concerned.

In the face of this peasantry shaped by Islam and which considered itself already to be a society of law, the Pashtun rulers had little room for manoeuvre. Everything that came from the capital was considered to be superfluous or impious. The leaders were inconvenienced by the constant lack of subsidies, which hampered development projects and degraded public service. As Afghanistan was too poor and too resistant to taxation, and as income from customs taxes was inadequate, they turned to foreign assistance and external funding. This indebtedness threatened the country's independence and placed its economy in the hands of others.

## 1929–1978

Previously subject to the whims of Bacha Saqao (Habibullah Ghazi), Afghanistan was taken in hand by Nader Khan, a former commander of the army. He was a high-ranking Pashtun, of the royal clan of the Muhammadzai, a tribe of the Abdali. Acceding to the throne in 1929, he immediately had a new constitution drafted, which reaffirmed the predominance of Islam and respect for traditional institutions.

In 1933, King Nader fell victim to a feud. His son, Mohammed Zahir, was proclaimed king a few hours after Nader's assassination and he reigned until the *coup d'état* of 1973. Reserved, shy and cultivated, he was only 20 years old when he came to the throne, and for many years his uncles governed in his stead. Under the regency of Hashem Khan (1933–46), Afghanistan remained on the sidelines of the Second World War by observing strict neutrality. In 1946, Shah Mahmud, another uncle of the king, took over the regency.

## Prime Minister Daoud (1953–1963) – opening up to the USSR

In 1953, Prince Daoud, the king's cousin and brother-in-law, became prime minister. He also reinforced the role of the state and administration. To implement an initial five-year development plan, he appealed for help to the United States and the USSR. However, as the price of their assistance, the United States asked Afghanistan to join the Southeast Asia Treaty Organization (SEATO), which would have implied recognition of the Pashtun territory situated in Pakistan. Daoud, who had laid claim to the

territory, rejected the deal and turned to the Soviet Union. Cooperation with the USSR, which would be very close from the outset, in particular in the technical and military field, began in 1955. From 1961 to 1963, the crisis between Afghanistan and Pakistan worsened. The borders were closed, and King Zahir, worried by the situation, forced his cousin to resign.

## The constitutional monarchy of King Zahir (1963–1973)

Zahir's seizure of power was accompanied by a return to neutrality with regard to both the Russians and the Americans. Organized on a competitive basis, foreign technical assistance started to pull the country out of under-development. In Kabul, in the first mixed university faculties, women students were free to reject the veil. The quarrels with Pakistan died down.

One of Zahir Shah's first measures was to grant his country a new constitution (its third). It was significant. Broadly inspired by the French institutions of the Fifth Republic and the American Constitution, it was carefully drafted and was used as a model in 2003 by the government of Hamid Karzai. The text set out the principles of a constitutional monarchy, guaranteed an elected parliament, a free press and the removal from power of all members of the royal family except for the king. It had the merit of clearly establishing the separation of powers: executive, judicial and legislative.

The National Assembly elected in 1965 was composed of three political groupings: a small communist party, a majority party of the centre and, lastly, a large conservative grouping. The perpetual divisions in the centre party blocked voting on legislation and hindered the government's ability to act. Six prime ministers followed in quick succession without achieving much, and the parliamentary system was gradually discredited.

On 17 July 1973, a *coup d'état* overthrew the impotent constitutional monarchy. The army, led by republican officers and communists, took power and proclaimed a republic. Daoud, the king's cousin, was placed at the head of the government.

## The Daoud Republic (1973–1978) – the new political deal

When the prince president returned to power, the political and social situation had changed considerably. A significant middle class educated in state schools had emerged. Soured by the discrimination it experienced (the most important positions continued to be handed out to the Pashtun elite), this middle class turned increasingly to fundamentalist Islam, which seemed to offer a political blueprint, or to Marxism-Leninism, whose principles had been broadly disseminated ever since Moscow started providing assistance. In the 1970s, the country's two communist parties, Parcham (the banner) and the People's Democratic Party of Afghanistan (PDPA), which subsequently took the name of Khalq, attracted an increasing number of members, in particular among army officers and teachers. As for the Islamists, who were revolted by Daoud's modernist and secular tendencies, they organized an uprising in the Panjshir in 1975. The insurrection was harshly suppressed.

## Economic development under the Daoud presidency

Despite this political handicap, the prince president embarked upon an ambitious seven-year plan (1976–83). It was not the first time such a programme had been launched in Afghanistan – there had previously been three five-year plans since 1956, which had met with varying degrees of success. The first two (1956–61 and 1962–67) were intended to provide the country with the infrastructure it needed for its development. To carry them out successfully, Afghanistan received US$65 million in external aid, including 50 per cent from the USSR and 30 per cent from the United States. The third plan (1967–72) emphasized agriculture and industry and endeavoured to complete projects already under way. The more rigorous seven-year plan brought together data provided by the ministries and produced a more coherent policy. To counter the USSR's influence, Daoud asked Iran for aid of US$2.4 billion. The Shah agreed to give roughly half that sum. Based on Soviet models, the plan made heavy industry and the exploitation of iron and copper mines a priority. This was a debatable choice for a country which remained essentially agricultural.

Nevertheless, Daoud obtained some outstanding results. During the five years of his government (1973–78), the foreign trade balance, previously in deficit, went into the black. Major agricultural projects were launched and small-scale industry flourished, including the mechanical workshops where the ingenuity of the Afghans flourished. If an economic and cultural assessment is to be made of Afghanistan in peacetime, the period selected for such an assessment should be the Daoud presidency.

## Agriculture, livestock farming and rural development

Afghans have always been proud of their food self-sufficiency, as only 12 per cent of the land can be cultivated. It is divided into irrigated land (*âbi*) and dry-farming land (*lalmi* or *dayma*), the latter being in valleys or foothills. Cereal production was the most important, varying between three and four million tonnes under the Daoud administration. Wheat accounted for two thirds, barley and maize for the rest. Fruit came second among the food crops and played a major role in the economy of Afghans, who exported them or ate them fresh and dried. Industrial crops developed in the same years. Between 1972 and 1977, production of sugar (from sugar-beet and cane sugar) rose by 31 per cent, of vegetable oil by 153 per cent and ginned cotton by 215 per cent. In Kunduz, the dynamic business Spinzar harvested 164,000 tonnes of seed cotton in 1975. French technical assistance and hydraulic works on the Kunduz River enabled this cotton crop to be extended, under the control of the Uzbek Lakais.

To improve yields, large water-storage dams were built with mixed results, due to the absence of an adequate drainage system and a lack of consultation with local farmers. The Helmand and Arghandab river valleys were fertilized by dams built in 1952 and 1953. Alongside these major projects, a development policy more in tune with physical and human factors was introduced. The participation of the local authorities ensured the success of these projects, which were focused on varied food crops and creating experimental farms. A return to small businesses, managed by the peasants themselves and suited to the situation on the ground, started in the 1970s.

Inexpensive projects designed to improve agriculture and the rural infrastructure (roads, dams, canals and bridges) were then launched in Kunar, Badakhshan, Hazarajat and the Balkh region. For their part, the Afghans set up a Department of Rural Development (DRD) whose role was to promote the village economy – whether agricultural or craft-oriented – by coordinating the work of ministries. The cooperative movement was launched with encouragement by the state.

Livestock farming, like agriculture, was a major economic asset. One of the country's riches was its approximately 24 million sheep, especially the superb Karakul breed. Craftwork was another important source of wealth. Domestic crafts enabled women to make a significant contribution towards raising family income (sometimes as much as 70 per cent). In 1977, carpet exports were worth $24 million to Afghanistan, that is, 8 per cent of annual exports.

## Means of communication

In the Daoud era the network was improved. Asphalt roads, which by then totalled 3,000 kilometres, formed a ring around the country, passing around the central mountain plateau and the high mountains of the east. In 1964 the piercing of the Salang tunnel, 2.7 kilometres long, carved out at an altitude of 3,363 metres by Afghan-Soviet teams, linked Kabul to the Soviet Union.

## The industrial sector

Industrial activity developed in the 1930s with the creation of the Afghan bank Bank-i Melli, which funded projects up until the Second World War. One of the earliest success stories was the textile company Spinzar, which exploited the cotton crop of the Kunduz region. Founded in 1935 by a partnership of the banker Abdul Majid Zabuli and the businessman Abdul Aziz 'Londoni', it extended its operations to six other towns in the north in the 1970s. At the time the company produced oil, soap and ceramics and built housing and schools for its employees. When Daoud seized power, he nationalized the banks and to a large extent controlled industrial activity, including Spinzar. Thus, the public sector produced cement, sugar, ginned cotton, chemical fertilizers and most textiles.

However, Daoud's main aim was to provide the country with heavy industry by using its iron, copper and natural gas reserves. South of the Ko-i Baba chain, the iron mines of Hajikak had excellent quality ore. Unfortunately, they were at an altitude of more than 4,000 metres and extraction required costly infrastructure. The exploitation of copper at Ainak was much easier. The Sheberghân region in the north-west supplied natural gas, which was exported by pipeline to the USSR starting in the Daoud era. In 1975, the chemical fertilizer and thermal energy factory of Mazar-e Sharif started transforming this form of energy. There are coal reserves estimated at between 400 and 500 million tonnes – it is particularly abundant in Darra-i Suf – but they have yet to be fully exploited.

## The archaeological heritage

Development of the archaeological heritage began in 1922 under King Amanullah, after the signing of a convention with France, and continued until 1978. It was soon rewarded with success, notably concerning the Buddhist monasteries and stucco statues at the Hadda site, the discovery of the Bagram treasure hoard at Kapisa, the inventory of the Buddhist monastery of Fondukistan, and the excavation of a fire temple dedicated by King Kanishka on the hillside of Surkh Kotal. These discoveries have shed light on the sophisticated Kushan civilization (first to fifth century AD), the expansion of Buddhism in Afghanistan and the art of Gandhāra. A still more ancient past was revealed in 1964 with the remains of Ai Khanoum, a Graeco-Bactrian city founded on the banks of the Amu Darya after the conquests of Alexander. Islamic monuments of the Ghaznavid, Ghurid (Minaret of Jam) and Timurid eras were also studied and restored. A national museum established near the Dārulaman Palace under Nader Khan housed a significant portion of excavated artifacts. The clause giving France the exclusive right to research was annulled in 1952 by King Zahir, and Afghan archaeology was then opened up to foreign scientific missions under the auspices of the United Nations and its agencies. The Americans were interested in prehistory, and the Indians, Japanese and Italians restored rock chapels and the great Buddhas of Bamiyan. In 1974, the city of Herat with its many fifteenth-century Timurid monuments was inscribed on UNESCO's World Heritage List. By the 1970s, Afghan archaeologists had taken over. In 1978, an Afghan-Soviet mission excavated a necropolis at Tillya Tepe, west of Balkh, dating from the first century BC, with tombs containing thousands of pieces of jewellery in precious metals.

## Development of education

The first secondary education establishments were created in the 1920s in Kabul, during the reigns of Habibullah and Amanullah, and included the Franco-Afghan lycée Estqlâl, the Nedjat secondary school (German development aid) and the Ghâzi secondary school (British development aid). Subsequently, university departments were founded: the faculty of medicine in 1931, faculty of law in 1938, faculty of science in 1942, arts faculty in 1944, faculty of economics in 1957, engineering school in 1963 and the Polytechnic School in 1963 (with Soviet development aid). Most of these establishments benefited from foreign assistance: France for law, medicine and pharmacy; the United States for agriculture and education, and the Soviet Union for the polytechnic training. Afghan students went on study trips abroad. In 1972, 7,400 students were registered at Kabul University and the Nangarhar College of Medicine near Jalalabad.

In 40 years, from the monarchy of Nader Khan (1931) to the Daoud republic (1973), the number of primary schools rose from 22 to 3,800; the number of pupils from 135 to 760,400, and the number of primary-school teachers from 105 to 21,920. A 1974 UNESCO report underscored this constant development that would continue through the decade. Despite this remarkable rate of expansion, outcomes remained modest. USAID statistics showed that 87 per cent of the population remained illiterate. Only 24 per cent of children between the ages of 6 and 14 attended school, taking into account the fact that the proportion was higher in urban than in rural areas. Although urban families sent their children to school, villages resisted state schools strongly, in particular for girls. This hostility grew after the establishment of the communist regime.

## FROM THE COMMUNIST REGIME TO THE END OF TALIBAN RULE (1978–2001)

On 27 April 1978, a *coup d'état* fomented by the communists overthrew the presidential regime. Daoud and his family were assassinated. The Democratic Republic of Afghanistan, proclaimed by the insurgents, was recognized immediately by the USSR. Power was handed to the leaders of the communist parties: the leader of Khalq, Noor Muhammad Taraki, became president; the leader of Parcham, Babrak Karmal, became vice-president; and Hafizullah Amin (Khalq), second vice-president.

From the outset, the number of arrests, instances of torture and executions rapidly increased. There was considerable in-fighting between supporters of Khalq and those of Parcham within the leadership. Babrak Karmal was sidelined and Taraki assassinated. Amin took control of the state and stepped up the repression. Confusion reigned within the government as uprisings broke out in garrisons and in the countryside, where agrarian reforms were received with hostility. On 25 December 1979, the Soviet army entered Afghanistan, ostensibly to restore order. Amin was killed and Babrak Karmal returned to power. The Soviet occupation of the territory had begun, and with it emerged the Afghan resistance movement, which was to last nine years.

Faced with failure after a decade of bloodshed, the Soviet Union finally withdrew its troops in February 1989, leaving in place in Kabul a skilful administrator, Najibullah, who tried in vain to negotiate with the leaders of the resistance. The military victory of the Afghans was not followed by a political settlement. The mujahedin, more rivalrous than ever, fought each other for four years. Kabul, which had been more or less spared during the Soviet-Afghan conflict, was then reduced to rubble, including its palace and museum (1992–94).

The population was war-weary. Pashtun fundamentalist groups then appeared on the scene and took advantage of the situation. They were the Taliban, 'seminarists' trained in extremely strict Deobandi Qur'anic schools in Pakistan. The Taliban made the roads safe and enabled the resumption of trade. In September 1996, they took Kabul and killed Najibullah. Darkness fell on Afghanistan. Women were no longer allowed to work, girls' schools were closed down, shari'a was applied with an absurd rigour, the country's Shiites were massacred and the great Buddhas of Bamiyan destroyed. Under the Taliban and their leader Mullah Omar, the country became a training ground for international Islamist organizations, most of which were already in place during the Soviet-Afghan war. Among them, Osama bin Laden's movement stood out by virtue of its financial resources, armament, auxiliaries from all over the world and its apocalyptic messianism.

On 9 September 2001, the resistance hero Commander Massoud, who opposed the regime with his Tajik fighters,

was assassinated in his Panjshir headquarters. As a result of the 11 September attacks in New York and Washington, two days later, which were attributed to Osama bin Laden's network, the Americans decided to intervene. They drove out the Taliban with the assistance of troops of the late Commander Massoud's Northern Alliance. In December 2001, a provisional government was formed under Hamid Karzai, a liberal Pashtun. King Zahir returned to his country to support the new regime.

The transitional government, composed of 29 ministers, endeavoured to implement a programme of reconstruction taking regional and ethnic considerations into account. A constitution was drawn up resembling that of 1964. Nevertheless, the world is eager to see whether the new Afghan state will be able to achieve recognition of its legitimacy and implement its decisions after 22 years of conflict. Afghanistan is not only a country in economic and cultural ruins that needs to be put back on its feet, but one that has been reshaped by civil war, where differences between regions, ethnic groups and religions have been aggravated, and autonomous economies based on the opium trade, smuggling and the sale of arms have continued to flourish.

# 34.4
## SYRIA, IRAQ AND LEBANON

*Mahmoud O. Haddad*

At the beginning of the twentieth century, the three geographical areas covered in this sub-chapter were provinces under Ottoman rule, and the main problem then was the polarization between two opposing policies (each with far-reaching cultural political implications): the first emanated from the centre of the empire in Istanbul, calling for centralization; the second originated in the different local Arab regional centres, especially Beirut, Damascus, and Basra, calling for decentralization and for accepting Arab cultural nationalism as a component of Ottoman political patriotism. However, during the war, the Ottoman-Turkish authorities accused several dozen Arab intellectuals and activists in Syria and Lebanon of conspiracy to gain independence by siding with the Allied Powers, and they were sent to the gallows. This incident was greatly lamented by Arab poets through poetry that sang the praises of the martyrs. In fact, rhythmic poetry remained the main form of expression of political, social and cultural currents. Rhythmic poetry and the journalistic essay dominated the cultural field between the wars. The main topics of discussion were national, romantic and social. The short story, the novel and autobiographies were gaining popularity at the same time.[1]

### POST-FIRST WORLD WAR

Although the end of the First World War witnessed the dismantling of the Ottoman Empire, the result was not the formation of one centralized or even decentralized Arab state as Arab nationalists had hoped, but the creation of a British mandatory system in Iraq and two different French mandatory systems in Lebanon and Syria. As a result, the Ottoman administrative boundaries were modified, especially by the French in Syria and Lebanon. Evidently, the problem of political and cultural identity came to the forefront once again. Various intellectuals recognized the pre-eminence of distinct identities. Those who accepted the new British and French divisions defined the new nation-state identities in a way compatible with European colonial cultural and political values. The predominant position, however, gave primacy to Arabic culture and emphasized a form of Arab nationalism that could lead to the political unification of at least Syria and Iraq. While Arab nationalism

saw the need to borrow certain elements from European culture, it nevertheless did not accept it uncritically and perceived a long-standing, though sometimes partial, friction between Arab identity and European colonialism, which was expressed in most available genres of literature. This friction came to the fore most noticeably after 1924, when Turkey abolished the Islamic caliphate and declared itself a fully secular state following in the footsteps of the West. The rationale for this and similar steps was that the Western culture was considered the only viable culture in the modern world, and it should be accepted and emulated without reservations, i.e. with its roses and thorns. This kind of thinking was not acceptable in the Arab region we are focusing on since the element of tradition (*turath*) and traditional identity still held sway. There were different Arab responses to this pro-Western stance. Such secularization was tantamount, according to the Islamic reformists or modernists, to total rejection of the Islamic religion and identity. They perceived the Turkish approach as a complete departure from Islam and Islamic identity, not only in the sphere of the state, but also in society at large. This position, which supported Arab and Islamic values while remaining open to modernization, was best voiced by Muhibb al-Din al-Khatib, a Syrian émigré living in Egypt who wrote:

> Renewal and reform are not mere desires; they are necessities of the first order to preserve the last breath of national life and to protect the last vestige of national greatness. Otherwise, we would be as good as finished ... Renewal is necessary and inevitable if we were to carry out what we have been enjoined to do when facing enemies, namely 'to prepare all the power we are able to muster'. And reform is inescapable if we intend to shed the cloak of obsequiousness ... I do not hesitate to state firmly and clearly that ignorance is better than a renewal with which foreigners intend to 'colonize' our hearts to spare them the toil of colonizing our lands. That is because when we become theirs, the slave and his belongings belong to his master. Would the youth of the glorious Arab East accept this sort of renewal?[2]

In engaging in such controversies sparked by the Turkish national initiative, we must bear in mind that the cultural

sub-regions we are discussing were interconnected and not independent of each other, especially concerning matters related to Islam and Islamic culture. But while the mainstream intellectuals in Syria and Iraq and part of Lebanon insisted on anti-Western Arab nationalism expressed either in secular terms and referring to language and common history or in both religious and secular terms blending Arab nationalism with Islam, there was a third trend in Mount Lebanon (which was expanded by the French to create the State of Lebanon within its present boundaries in 1920) involving a distinct Lebanese nationalism, friendly to the West and especially to France, refusing Arab political nationalism yet finding merit in certain aspects of Arabic culture, especially the Arabic language.

Since Britain was less intrusive in the cultural affairs of Iraq, its capital, Baghdad, became the centre for disseminating official Arab nationalist culture, especially under King Faysal I (1885–1933). This was most evident in the teaching system supervised by the prominent Arab nationalist Sati' al-Husri (1876–1968) and backed by the ruling elite that was partly composed of both Iraqi and Syrian army officers who participated in the Arab Revolt against the Ottoman Turks during the First World War. But Beirut and Damascus remained ahead of Baghdad in most cultural fields.

The inter-war period witnessed an 'intellectual and cultural awakening'[3] in the Lebanese capital, Beirut, which maintained its prominent role in the exchange of ideas and as the main publishing centre for different political and non-political topics. Music, art and theatre attracted an audience and 'allowed individuals and groups to transcend their parochial identities and melt into a common cosmopolitan sub-culture'.[4] Damascus and Baghdad followed suit.

The Arab defeat in the first Arab-Israeli war in 1948, just a few years after these countries gained independence, was a blow to the traditional ruling elite, who were perceived as the stooges of the hated West. Oswald Spengler's book *The Decline of the West* was translated into Arabic and gained currency among the reading public.

## CULTURAL DEVELOPMENT

The twentieth century may be divided into several phases in terms of the cultural development of Lebanon, Syria, and Iraq. The first third of the century can be regarded, to a large extent, as a continuation of the process of what is generally termed as the Arab literary revival (*al-nahda*), which started in the previous century and assumed the double role of reviving medieval or classical Arabic works of science and culture while translating Western works into Arabic and adapting new forms of Arabic culture, through translation, to Western norms.

Until the beginning of the twentieth century, traditional Arab cultural content included literary genres such as poetry, the revived classical *maqama* (rhythmic prose), *al-tarajim* and *al-siyar* (biographies). From the mid-nineteenth century and under the influence of Europe, a new Arab cultural life began to flourish. Although some older genres survived, others started to weaken or fade away. Some were revived for a short period of time like the *maqama*. Concurrently, other Western genres started to gain ground

such as the novel (*al-riwaya*), the journalistic essay (*maqala*), the short story (*al-qissa*), and theatrical plays (*al-masrah*).[5] But it was after the third decade of the twentieth century that these other genres dominated cultural life in Syria, Lebanon, and Iraq.

Inevitably, this interaction between the Western and local cultures did not express itself uniformly in all three Arab countries under study here. Thus, it is important to point out that the virtually land-locked Iraq, turned toward Iran and the Persian Gulf, lagged behind Syria and Lebanon, which were more exposed to Mediterranean influences and were, in a sense, more culturally 'advanced' than their Eastern neighbour.[6] Moreover, because of the immigration of many Syrian and Lebanese intellectuals to Egypt in the nineteenth and early twentieth centuries, there existed what we may term a common cultural axis that ran from Egypt to Lebanon, Syria, and, to a lesser extent, Iraq. It is, in fact, possible to suggest that these countries belong to one cultural sub-region until the present day. This is significant because it suggests that different Arab local cultures did not only interact with the West, but with each other as well, forming a number of regional Arab sub-cultures with shared features.[7]

## Science and technology

The scientific development in the specific areas under investigation (Syria, Lebanon, and Iraq) and in the whole Arab world in general during the twentieth century was unfortunately meager. Scientific and technological research and application were not properly funded and although some of the nationals of these countries did make some important contributions in some scientific fields, they were usually accomplished by émigrés working in Europe or in the United States. One opinion voiced in the middle of the century stressed that even if the term 'science' was enlarged to include the social sciences, the region was surely in a sorry state.[8]

## Education

One important indicator worth mentioning here is the level of education and research. According to last available statistics of 1995,[9] the gross percentage of enrolment rate of students of primary education age who attended primary schools was 109 per cent in Lebanon and 101 per cent in Syria. Unfortunately, statistics for Iraq are unavailable. These percentages become more meaningful if we compare them with the statistics for the Arab region as a whole (83.8 per cent) and for Europe (106.7 per cent) and the world (99.6 per cent). Secondary education enrolment reached 24 per cent in Lebanon and 17.9 per cent in Syria, in comparison with 12.5 per cent for the whole Arab region, 47.8 per cent in Europe and 16.2 per cent for the entire world. Tertiary education levels were 27 per cent in Lebanon and 17.9 per cent in Syria, in comparison with 12.5 per cent for the whole Arab region, 47.8 per cent in Europe, and 16.2 per cent worldwide. The breakdown of tertiary education by subject matter is as follows: in Lebanon, 26 per cent humanities, 52 per cent law and social sciences, 17 per cent natural sciences (including engineering and agriculture), and 3 per cent in medical sciences; and in Syria, 21 per cent,

35 per cent, 29 per cent, 11 per cent, respectively. The science and technology output is measured by the number of papers published in international journals from 1990 to 1995: 471 for Syrians, 500 for Lebanese, and 931 for Iraqis.

Despite the great variety among the countries, uniform developmental trends can be identified: i.e. increases in population, urbanization, and rationalization. Moreover, the salaried middle-class element plays an important role in all three countries. But while this development led to a radical social change in Syria and subsequently in Iraq, around the middle of the century when the middle classes of those countries took control of the state and declared its intention of ending superficial decolonization, the change was more gradual in Lebanon, which did not wish to tamper with the free economic market system.

Naturally, these developments were reflected in the cultural sphere. In Syria and Iraq, theatre flourished under the auspices of the state, while in Lebanon theatrical activities were promoted through private initiative. But in all three countries the theatre was influenced by a variety of Western theatrical schools. Similarly, Western trends influenced the field of painting in these countries.

During the same period, new types of literary forms emerged, such as the existentialist and the feminist novel, both of which brought to the forefront the two topics of the destiny of the emancipation of the individual and of women. In Lebanon, writer Suhayl Idriss promoted the existentialist movement, and his female compatriot Leila Baalbaki is considered the country's foremost feminist novelist.

The revolutionary period was the focus of narrative texts as well a new type of Arabic poetry whose value remains a subject of debate in literary circles. Iraq found its vanguard role in presenting a new form of modern poetry that was started by the school of Badr Shakir al-Sayyab (1926–1964). What was most impressive about al-Sayyab's poetry is that it blended modernity with rhythm. In the early 1960s, the periodical magazine *Shi'r* (Poetry) attempted to promote another school of unrythmic poetry that enjoyed ephemeral success in Lebanon.

## POST-1967

The overall cultural picture in these countries changed to a great extent after a second Arab defeat in the 1967 war with Israel. The new ruling class as well as the West were blamed for this turn of events. Directly after the war, the perennial issues resurfaced: independence and the preservation of local identity in face of Western culture and power. Expressed more eloquently, 'now in order for the Arabs ... to remain themselves while joining the industrial world that surrounds and beleaguers them from within, they would have to impress the rhythm of their material advancement upon all their other modes'.[10] From this concern, a more leftist and radical trend emerged, but it was not long before it produced its more powerful antithesis: a right-wing trend that found no outlet in the different modern cultural venues like the theatre, the novel, and poetry, but rather revived the conservative part of classical religious literature popularized in numerous newspapers and magazines of the early 1970s. Unlike the modernist Islamic trend at the beginning of the century, it revealed a more self-centred anti-modernist orientation whose main concern was preserving Islamic identity in a variety of fundamentalist forms. This trend is still very active, but it lost its earlier vigour. Today, it is impossible to identify any single cultural tendency that carries a well-defined message. The countries under discussion, like many other Arab countries, are passing through a cultural dilemma the results of which are difficult to predict.

In conclusion, it is evident that the last quarter of the twentieth century was not especially favourable for this region. Lebanon endured a civil war (that had regional dimensions) from 1975 to 1990. Iraq was entangled in a bloody war with Iran (the so-called First Gulf War) that lasted throughout the 1980s. Iraq's economic and political differences with the US and neighbouring Kuwait led to its invasion of the latter in 1990. This led in turn, in 1991, to the Second Gulf War, led by an international coalition headed by the United States and the United Kingdom which drove Iraqi troops from Kuwait and imposed a strict regime of sanctions that was still in effect in 2003 when the US and a few allies launched a full-scale attack on Iraq with a view to eliminating Saddam Hussein, based on the pretext that he was stockpiling weapons of mass destruction. At the present time, the situation in a wartorn and occupied Iraq is far from resolved. Clearly, the political and military situation in both Lebanon and Iraq had a negative impact on their cultural and scientific scenes.

It is noteworthy, however, that some signs of revival started to emerge at the end of the century in the fields of art. In Lebanon and Syria the novel was established as the most important genre of cultural expression. The new Lebanese novel, represented by many intellectuals, dealt with the experience of the civil war, while the Syrian novel, whose most prominent spokesperson is Hanna Mina, continued to focus on social affairs.

## NOTES

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2.    M. al-Din Al-Khatib, 'Hamlat al-Tajdid wa'l Islah Wa Hal Laha Qadah Hukama' Wa Hal Rasamu Laha al-Khitat al-Hakima? [The campaign for Renewal and Reform: Does it have wise leaders and have they drawn wise plans for it?], *Al-Hadiqa*, Vol. 5, Cairo, 1930–1931, pp. 190–206.
3.    S. Khalaf, 'Lebanon's Golden/Gilded Age 1943–1975,' in C. Chartouni (ed.), *Histoire Sociétés et Pouvoir Aux Proche et Moyen Orient*, Tome 1, Paris, 2001, p. 88.
4.    Ibid, p. 93.
5.    M. K. Al-Khatib, *Takwin al-Riwaya al-'Arabiyya* [The Formation of the Arab Novel], Damascus, 1990, p. 5.
6.    R. Allen, *The Arabic Novel: An Historical and Critical Introduction*, (2nd ed.), Syracuse, 1995, pp. 16–17.
7.    J. Berque, *Cultural Expression in Arab Society Today*, translated by R. Stookey, Austin, 1978, p. 3.
8.    C. Malek, 'Al-Bahth al-'Ilmi Fi al-'Asr al-Hadir' [Scientific Research in the Present Age] in C. Malek et al., *Al-Bahth al-'Ilmi Fi al-'Alm al-'Arabi* [Scientific Research in the Arab World], Beirut, 1956, pp. 6–7.
9.    *Arab Human Development Report* 2002, pp. 152–56. This report was published by the United States Development Programme in 2002.
10.   J. Berque, op. cit., p. 29.

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# 34.5

## PALESTINE AND JORDAN

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### *Ali Mahafzah*

Before the nineteenth century, Palestine and Jordan did not pursue modern scientific disciplines, such as natural and applied sciences. In both areas, education was confined to the *kuttabs* (primary schools), which were housed in mosques, churches, Muslim, Christian or Jewish schools. Beginning in the second half of the nineteenth century, modern education was introduced through foreign missionaries and subsequently by the Ottoman Empire.

Since the creation of the British Mandate in Palestine, two systems of national education based on language and race developed independently of missionary schools. Since educational opportunities were mainly concentrated in the cities, rural areas were largely deprived of modern schools. Compulsory education was non-existent, which led to growing illiteracy among the Arab population. Arab education, it should be noted, did not aim to serve economic and social development, and there was a very limited interest in developing vocational education. The authorities in power used general education as a means of producing compliant government employees for the mandate authorities. The most significant Arab higher educational institutions during the mandate were the Government Arab College (Teachers Training College), the Women Teachers Training College, and Rashidiyyah Secondary School (later College) in Jerusalem, the Women Teachers Rural Training College in Ramallah, the Trade School in Haifa, and Kadouri Agricultural School in Tulkarem. The Jewish educational system was supervised by the Jewish Agency, which established its own curricula and programmes that endeavoured to fulfil the aspirations of the Zionist movement and were free from any supervision or control by the mandate government. Thus it must be concluded that the education available to Arabs failed to prepare them for practical life.

In Jordan, which came under the rule of the Arab government in Damascus from 1918 to 1921, the number of government schools was increased to 20 primary and elementary schools. This number continued to rise under the Arab regime in power before the British Mandate (1921–46). In the 1922/23 academic year, there were 44 government schools; by the end of the British mandate (1946/47) a total of 77 schools were operating. The number of students during the same period rose only slightly: from 3,316 to 10,729. Private schools increased from 33 in 1925/26 to 100 in 1938/39. The Arts and Crafts and School was Jordan's only vocational school.

After the first Arab-Israeli War (1948–49), the West Bank was integrated into Jordan while the Gaza Strip remained under Egyptian military administration. Under the Jordanian-Palestinian period (1950–67), there was a rapid growth in the number of schools. In 1950/51, there were 402 schools, 319 for boys and 83 for girls, with a total student enrolment of 65,793 students. In 1966–1967, the number of schools rose to 1,532, some 900 of which for boys and 632 for girls, with a total student enrolment of 302,668.

As a result of the Arab-Israeli War, about 500,000 Palestinians were forced out of the cities and villages by the Israeli occupation forces and became refugees in the West Bank, Gaza Strip, Jordan, Lebanon and Syria. The United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) was created on 8 November 1949 to take care of these displaced populations. The students receiving their education at UNRWA-sponsored schools totalled 42,122 in 1950/51. This number steadily grew to 181,347 in the 1965/66 academic year. In the same year in Jordan, the number of students enrolled in UNRWA schools totalled 106,268 or two thirds of all refugee students. UNRWA also established a male teacher training institute at Shu'fat, a suburb of Jerusalem, in 1956 and another for female teachers in Nablus. Three vocational training institutes were also established in the West Bank and two in the Gaza Strip. In 1967, UNRWA schools in Jordan rose to 734, while schools in the in the Gaza Strip numbered 577.

Vocational education with its various industrial schools witnessed considerable development on both banks of the River Jordan. The total student enrolment in these schools rose from 148 in 1960/61 to 775 in 1966/67. The number of students enrolled in vocational training centres increased from 37 in 1960/61 to 262 in 1966/67. Agricultural education in Jordan started later than in Palestine. Commercial education on both banks of the River Jordan was first implemented in 1952 in Amman and Nablus. Commercial courses were created in the other cities of the kingdom during the 1950s. The student population rose from 26 in 1952/53 to 1019 in 1966/67. The first university in the kingdom of Jordan was established in 1962.

In 1967, the whole of Palestine fell under Israeli occupation, and Israel opened its borders to unskilled highly paid labour. Palestinian youths rushed in the thousands to this prosperous labour market, owing to their poor economic

conditions under Israeli occupation. As a result, learning and education lost status in the eyes of the young Palestinian university graduates, who faced serious unemployment problems. Thus students began to drop out of school and university and join the Israeli labour market. At the same time, the Israeli occupation forces imposed laws and regulations including charging high school fees and banning many Arabic school textbooks. Israel frequently closed schools and universities and arrested many teachers and students.

Despite Israeli restrictions, government schools in the West Bank and the Gaza Strip totalled 1,084 in 1994–95, including 15 vocational secondary schools. UNRWA supervises six vocational training centres. There are also 18 community colleges (or intermediate university colleges) in both territories, which trained 4,110 students in technological courses in these colleges. There are eight universities and four university colleges with a total student population of 15,632 at the Bachelor degree level, and 945 students pursued graduate studies in the 1998/99 academic year.

In Jordan, after the occupation of the West Bank, the number of students in 1967/68 totalled 192,931 and rose to 982,429 in the year 1999/2000 including 32,764 students in vocational training. In 1999/2000, Jordan could boast eight state universities and eleven private ones. The total student enrolment was 105,813 undergraduate students and 6,670 graduate students. Community colleges totalled 51, including 28 government and 21 private colleges in addition to two UNRWA colleges and three nursing colleges.

With regard to culture, printing presses and newspapers appeared in Palestine during the nineteenth century (e.g. the Franciscan Press, the Roman Orthodox Monastery Press, the Armenian Press and the English Missionary Society Press). These printing presses multiplied during the British Mandate. The Jewish community had its own Hebrew presses, while the Arabs and the British administration operated presses in their respective languages. During the Jordanian-Palestinian period, the number of Arabic presses rose, while a number of Arabic presses continued to operate under Israeli occupation. Arabic presses numbered 98 between 1914 and 1984.

*Al Quds al-Sharif*, the first newspaper published in Palestine, dates back to 1876. It was the organ of the Ottoman ruler of Jerusalem, or *mutasarifiyah*. In the same year the newspaper *Al-Ghazal* was founded. Between 1908 and 1918, some thirty newspapers came into existence. In Jordan, the newspaper entitled *Al-Sharq al-Arabi* appeared in 1923 as a governmental organ whose name was later changed to the *Official Gazette of the Emirate of Transjordan*. But the first daily newspaper in Jordan was published in 1927 under the name of *Al-Urdun*. Subsequently, other newspapers came in succession, bringing the number to ten in the year 2000, when the West Bank and Gaza Strip claimed the same number of Arabic newspapers.

Professional associations and cultural unions spread throughout Palestine and Jordan. The Palestine Students' Union was founded in Egypt in 1959. It was followed by the Palestine Workers General Union, established in Gaza in 1963. The Palestinian Women General Union, was inaugurated in 1971, the Palestinian Teachers General Association in Damascus in 1972 and the Palestinian Engineers General Federation in Baghdad in 1973. Some twenty-eight Palestinian literary and cultural leagues were

created between 1914 and 1984. During the same period, 163 cultural and sports clubs opened in Palestine.

Palestine has nine research centres: the Research and Documentation Centre at al-Najah National University (1972); the Documents and Research Centre at Bir Zeit University (1976); The Arab Intellectual Colloquium Society in Jerusalem (1977); the Rural Studies Centre in al-Najah National University (1981); the University Graduates League Research Centre in al-Khalil (Hebron) (1982); the Islamic Research Centre in Jerusalem (1985); the Palestine Liberation Organization (PLO) Research Centre; the Palestinian Studies Foundation (1963) and the Arab Studies Society in Jerusalem (1980).

Numerous poets and writers were active in Palestine during the twentieth century. Among the most prominent are Ibrahim Touqan, Abdul-Karim al-Karmi, Youssuf al-Khatib, Ishaq Musa al-Husseini and Akram Zu'aytir. Among the leading Palestinian historians are Bandali Jozy, Abdul-Latif Tibawi, Nabih Amin Faris, Nicola Ziyadeh, Irfan Shahid, Hisham Sharabi, Anis Sayegh, Mahmoud Zayid and Kamil al-Asali. Public and private libraries existed in Palestine on a large scale throughout the twentieth century. Palestine possessed forty-eight libraries during the British Mandate. During the Jordanian-Palestinian period, five public libraries were opened by the municipalities of major cities in the West Bank. Under Israeli occupation, however, importation and circulation of 5,410 books was banned between 1967 and 1985. This led to a decrease in the number of publishing houses in the West Bank from twenty-three to four.

Applied arts also appeared in urban as well as rural areas in Palestine during the twentieth century. Urban artists practised engraving, decoration and calligraphy, while in rural areas tattooing, embroidery and weaving were widely practised. In addition, many Palestinian craftsmen reproduced icons for sale to local monasteries and foreign visitors. A number of outstanding Palestinian painters gained prominence in the course of the century: Ismail Shammut, Sophie Halabi, Naheel Bisharah, Paul Gerogsian, Abdullah Ni'wash, Fathi Ghaban, Jumanah al-Husseini and Naji al-Ali. Sculpture in Palestine was influenced by principal Arab and foreign artistic movements. Eminent sculptors include Abdul-Hayy Musallam, Mustafa al-Hallaj, Muhammed Bushnaq and Nazik Ali Ammar.

As for popular folkloric arts and traditions, the Palestinians have developed beliefs, customs and traditions related to betrothal, marriage, birth and child raising. The Palestinian cultural heritage also comprises numerous folkloric dances, rhythmic clapping, Sufi (dervish) dances, solo and collective popular songs performed by women. Since the 1930s, Palestinian musical bands have appeared featuring string musical instruments (rebec, lute), wind instruments (clarinet, double-barrelled flute and other types of flutes) and percussion instruments (castanets, drums, tambourines, kettle drums, and tabors).

Jewish colonizers produced the first propaganda films in Palestine in 1912, and such films continued throughout the 1930s and 1940s. During the British Mandate, new motion picture houses opened for the screening of Egyptian commercial films. During the Jordanian-Palestinian period, film production ceased. Documentary films about Palestine and the Palestinian question outside Palestine appeared in 1968: fifty-three such films were produced between 1970 and 1984.

Since the creation of Transjordan in 1921, Jordanian writers explored various literary genres, including the short story, the novel, poetry, journalistic articles, literary criticism, children's literature, while studies and research developed. The court of the monarch Abdullah ibn al-Hussein I provided a congenial meeting place for Jordanian and other Arab poets and literati. Among the prominent literary figures were King Abdullah himself, Mustafa Wahbeh al-Tal, Abdul-Munim al-Rifai, Abdul-Halim Abbas, Husni Fariz and Rashid Zayd al-Kelani.

Popular mores and traditions in Jordan's rural and urban areas were nearly identical to those in Palestine. Jordanian painting developed in the 1960s through the efforts of artists such as Rafiq al-Lahham, Mouhanna al-Durrah and Princess Wijdan Ali. To promote artistic movement in the kingdom, the Department of Culture and Fine Arts was established in 1966, followed by the Jordanian Royal Foundation of Fine Arts and the Fine Arts Institute. Members of an artists' union established in 1978 exhibited their works in Jordan and abroad. Noteworthy sculptors include Muna al-Saudi and Karram al-Nimri. Khalid Khrays works in the medium of lithography, while Farouq Lambaz and Mazen Asfour are renowned for their collages and Rabah al-Sghayyir, Jalal al-Refai, Mahmoud Sadiq and Emad Hajjaj are considered the country's most famous caricaturists.

Distinguished by its rural Bedouin character, Jordanian music constitutes an ancient cultural heritage. With the creation of the Jordanian Broadcasting station in Amman in 1959, popular songs were performed with string instruments rather than on the traditional instruments such as the *shibbabeh* (flute), *mijwiz* (double-barrelled flutes), tabor and rebec. Progressively, Western musical instruments were also introduced. Jordanian music gained wider exposure thanks to the programmes of the Jordanian Television (JTV), which was founded in 1968. The Jordanian Musicians League was established in 1980, and the Jarash Annual Festival inaugurated in 1981 further contributed to the promotion of Jordanian music particularly in the Arab world. Since 1992, several Jordanian music festivals have been organized. According to official estimates, approximately 200 Jordanian singers and over 30 musicians work in a professional capacity. A faculty of fine arts was established in Yarmouk University in the early 1980s and the National Musical Conservatory was established in collaboration with the Noor al-Hussein Foundation. In addition, the Jordanian Academy of Music opened its doors in 1990. One of the largest of the ten orchestras active in Jordan in 2000, the Jordanian Armed Forces orchestra, founded in 1977, boasts 120 performers.

In the field of cinema, motion picture houses first appeared in Amman in the 1930s and spread to other Jordanian cities over the next two decades. The first Jordanian-produced film was premiered in 1948, and in 1957 the film entitled *Sira' fi Jarash* (Struggle in Jarash) was produced by the Jordanian film production company.

The creation of the country's first theatre association in Irbid in 1945 marked the earliest attempt to promote Jordanian theatre. However it was not until the foundation of the Jordanian Theatre Family in 1962 that theatrical arts began to flourish.

In the last three decades of the century, cultural activity has increased thanks to the efforts of such organizations as the Jordanian Writers Union, the Jordanian Writers League, the Royal Academy for Islamic Civilization Research (Al-Bait Foundation) (1981), the Arabic Language Academy (1977) and the Arab Thought Forum (1981), as well as dozens of cultural forums and research centres operating under the auspices of universities, and numerous privately operated independent cultural institutions and associations.

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# 34.6

## THE GULF COOPERATION COUNCIL
## SAUDI ARABIA, KUWAIT, BAHRAIN, QATAR, UNITED ARAB EMIRATES, OMAN

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*Mariam Lootah*

The six countries examined in the present sub-chapter are the members of the Gulf Cooperation Council (GCC), a body established in 1981 in the face of various external threats (e.g. the overthrow of the Shah of Iran, the Soviet invasion of Afghanistan and the outbreak of the Iran-Iraq conflict) to ensure regional security and stability for its highly strategic oil-producing member states. According to the organization's stated purpose:

> while, on one hand, the GCC is a continuation, evolution and institutionalization of old prevailing realities, it is, on the other, a practical answer to the challenges of security and economic development in the area. It is also a fulfilment of the aspirations of its citizens towards some sort of Arab regional unity.

### SAUDI ARABIA

The alliance of the strict Islamic sect known as the Wahhabi and the Saud tribes determined the contemporary history of the Arabian Peninsula and played a crucial role in the establishment and the continuity of the Saudi Kingdom. The Saudi state was founded in 1726 even though the peninsula officially remained under the control of the Ottoman Empire.

At the end of the First World War (1914–18), which marked the demise of the Ottoman Empire, the geopolitical map of the Arab World (or Middle East) was redesigned by the colonial powers: Syria and Lebanon fell under French influence; Palestine, Iraq, and the Arab Peninsula were placed under British control. However, by the end of the Second World War, American influence in Saudi Arabia had grown rapidly. American oil companies controlled Saudi oil production, and the Saudi Kingdom became America's closest ally in the region after Iran.

With the discovery of oil in the 1930s, the country witnessed some economic development and modernized its major cities, but the Wahhabi-Saudi coalition, regarded as the bedrock of power, impeded social and political progress, particularly as regards the status of women and the basic civil liberties. To this day, almost all significant cultural activities are restricted. The participation of women in economical, cultural and social life is limited. During the twentieth century, Saudi Arabia remained a closed society.

The war of liberation of Kuwait from the Iraqi occupation (1990–91) followed by the Anglo-American invasion of Iraq (March 2003) has shaken the status quo in the Gulf States, particularly Saudi Arabia. Political and cultural stagnation in the Saudi society have created a state of general discontent in the country, a favourable ground for the emergence of clandestine political organizations. Yet, the increased American military presence contributed to the emergence of extremist Islamic movements, such as al-Qaida. In the present context, even the near future of the Saudi Kingdom is difficult to predict. But it is almost certain that the absence of serious democratic reforms will create social and political unrest and pave the way for general instability.

### KUWAIT

Kuwait gained its independence from Britain in 1961. Among the factors that have contributed to Kuwait's instability over the last four decades of the twentieth century are geopolitical and territorial issues, the country's relatively small population (750,000 persons, 2 million including expatriates), the lack of a strong national identity, and Kuwait's vast oil reserves. Despite these difficulties, the traditional gap between the people and their rulers has been bridged by introducing a certain degree of national dialogue in the political processes. The first *majlis*, or consultative council, was created in 1921.

With the arrival of King Ghazi in Iraq in 1938, Baghdad claimed that Kuwait was part of Iraq's Basra region to the south. In the same period (1938–39), oil was discovered for commercial exploitation, and Britain intended to ensure that Kuwait would remain under its sphere of influence and independent from Iraq. In 1938, the newly elected *majlis* recognized the power of the members of the Parliament. As Kuwait increases the political participation of its people, it will reinforce the country's national and cultural identity; however it is believed that Kuwait's traditional non-constitutional political system cannot continue indefinitely.

## BAHRAIN

The Emirate of Bahrain occupies an archipelago in the Persian Gulf that has been inhabited for over 6,000 years. The capital of the Kingdom of Bahrain today is Manama. Bahrain's contemporary history is marked by the early emergence of reform movements in the country. The first movement, created in 1923, stressed two essential points: the establishment of a Majlis Shūra (Consultation Council), and the end of the British influence in the country. By supporting this position, Bahrain's ruler, Sheikh Issa Ben Ali al Khalifa, was removed from power.

This first reform movement was followed by a second (in 1938), and a third more effective wave of reform in 1945. Known as the National Union Committee, this latter movement led to more elaborate reform programmes that highlighted the importance of national unity. Abdel Rahman al Baker in collaboration with Abdel Aziz al Shamlan headed the National Union Committee. The movement's success is attributed to the fact that, unlike the two earlier attempts at reform, it won the support of the Shiites and Sunnites communities within Bahraini society.

Bahrain gained independence from Britain in 1971, yet the British continue to exert considerable influence on the country. The rise of Sheikh Hamad al-Khalifa to power after his father's death in 1999 marked a new era in Bahraini history. In 2002, Bahrainis elected members of the lower house of Bahrain's reconstituted bicameral legislature, the National Assembly.

## QATAR

Qatar, a small country with a very recent history, has a population of about 60,000 native Qataris and over 300,000 expatriate workers. The contemporary history of Qatar was marked by the rise to power of Sheikh Hamad bin Khalifa Āl Thani by the 1995 *coup d'état* against his father. An ambitious man, his agenda calls for political reforms, the establishment of a national parliament and the writing of a constitution.

Some social reforms concerning the participation of women in the public life had been undertaken, as evidenced by the fact that women have been appointed to high-level public positions. However, in exchange for the support of the United States, the Sheikh was forced to allow the Americans to install a military base in Doha and to play a role in Qatar's domestic and foreign policies.

## UNITED ARAB EMIRATES

The United Arab Emirates (UAE) is a federation of seven emirates: Abu Dhabi, Dubai, Sharjah, Ajman, Umm al-Qaiwain, Ras al-Khaimah and Fujairah. The rulers of the Emirate of Ras al-Khaimah, the Al-Qawasim tribe, owned the region's considerable naval force and stood up to British acts of aggression for more than half a century. In 1819, the British invaded Ras al-Khaimah, the historic capital of the Al-Qawasim, destroying much of their naval fleet, and imposed the treaty of 1820, which marked the official beginning of British colonization of the emirates (formerly known as the Trucial States). Agreements with the British required the al-Qawasim fleet to halt all maritime activity including fishing, and subsequently the fleet was completely destroyed.

Between 1820 and the opening decades of the twentieth century, time seemed to stand still in the region. In 1936, a reform movement emerged in the Emirate of Dubai and resulted in the election of a *majlis* among the notables. Some administrative and educational reforms were initiated as a result, but this promising undertaking failed after six months owing to British intervention.

Oil was discovered in Abu Dhabi in the 1960s, and the bulk of the oil revenues were spent on building state infrastructures. In 1971, the seven emirates united to form the present federation. However, the country's poorly planned development resulted in negative setbacks in respect to social and cultural issues. The Emirates currently face a problem that threatens the identity and security of society: the country's great demographic imbalance. The overwhelming majority (approximately 85 per cent) of the population are expatriate workers, most of which are not of Arab origin. The three challenges facing the Emirates today are security, the safeguarding of national identity and democratic reforms.

## OMAN

One of the world's foremost maritime nations, Oman served as an important link on the trade routes between Mesopotamia (present-day Iraq) and India and China. From the eighth century, a minor school of Islamic thought, known as the Ibadit School, ruled Oman for more than one thousand years and instituted a highly original political system, the Imama. Unlike the major Islamic branches, Sunni and Shiite, the Ibadits categorically rejected the hereditary system of power, adhered to the principle of Shura, consultation, and the free election of the political and religious leader or imam. This principle introduced a theoretical base for democracy in Islamic political thought and has also served to consolidate the national political culture of Oman

Beginning in the second half of the eighteenth century, the British presence and influence grew rapidly. The powerful Omani fleet was destroyed along with that of the Trucial State (present-day United Arab Emirates). Between 1900 and the beginning of the rule of Sultan Qaboos bin Said in 1970, Oman had practically disappeared from the international scene. The sultan has undertaken remarkable political, economical and cultural reforms, which has enabled Oman to strengthen its rich cultural and historical traditions. Since the 1970s, Oman has played an active role in Arab affairs and on the international scene thanks to its pragmatic foreign policy.

## CONCLUSION

The major external and internal factors that have marked the region through its long history are the tribal structures, religion, British colonization and the discovery of oil.

Even though not all of these Gulf States developed along the same lines politically, owing to specific domestic, regional and international circumstances, it is clear that there are many similarities concerning the manner in which they were established. Nonetheless, it must be noted that

socio-economic development has not been accompanied by political and, above all, democratic reform.

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# 34.7
## EGYPT

*Anouar Abdel-Malek*

Contemporary Egyptian society and culture can best be understood in the context of the re-emergence of Egypt after four centuries of marginalization and decline. This renaissance occurred as the result of the vision and decisive leadership of Muhammad Ali in the first half of the nineteenth century, precisely when Egypt faced relentless penetration by foreign investment, which paved the way for British occupation (1882).

## MUHAMMAD ALI

From the onset, Muhammad Ali clearly defined his historic goal: the creation of a modernized Egyptian society and state in order to achieve the revitalization of the Islamic heartland. For Muhammad Ali, modernization meant endowing the state with its own army, a state-owned industrial base and a system of modern education inspired by the European achievements from the Renaissance to the age of revolutions (scientific, industrial, political) and with an overall vision of national culture. This was achieved thanks to the creative energies of Ibrahim Pasha and Rifaa al-Tahtawi, with the support of devoted European (mainly French) experts. By 1830, Egypt had created an advanced industrial state-owned sector and the most powerful modern army outside Europe. Owing to the vision of Tahtawi, the state and society had access to an extensive network of highly trained cadres in all major fields of activity, while progress in education continued, mainly under Ali Mubarak. Starting with the adoption of selected achievements of French society during the Napoleonic era and its aftermath, Tahtawi resolutely oriented national cultural policy towards national unity and social progress as expressed in his motto: 'May the place of happiness for all of us be Fatherland, which we shall build with liberty, thought and industry!'

It took the coalition of all major European states to compel Muhammad Ali to dismantle his protective economic shield. Thus, the London Convention (1840) stifled Egypt's well-advanced modernization programme – the very process that the Japanese Emperor Meiji chose to study in 1868 upon his rise to power.

Between 1840 and 1881, European financial intervention, facilitated by the building of the Suez Canal, led to gradual hegemony of foreign powers over the Egyptian economy. The first Arab-elected parliament coincided with the formation of a vigorous private capitalist sector under Ismail (1867–79). In the upsurge of the national and democratic movement, a second stage of the Egyptian renaissance developed under the influence of Nadim, Baroudi and military figures Arabi and Ebeid. The 1881 Revolution provided the pretext for the British invasion, leading to the occupation of Egypt in 1882. The British occupation put the clock back in the political, economic and cultural fields but did not affect the vital transport infrastructure that ensured the export of cotton. While social development could not proceed towards the creation of a national bourgeoisie, education had to bear the brunt of Dunlop's vicious restrictive policy.

Facing the oppressive measures of the occupying power, several significant developments arose. The wealth of the Egyptian upper classes depended on the growth of dependent agrarian capitalism. On the cultural front, the press – under the converging efforts of Arab intellectual émigrés who sought refuge in Egypt from the 1870s and joined forces with the heirs of Nadim (mainly from the National Party of Mustafa Kamel and Mohamed Farid) – nurtured the upsurge of the national movement towards independence, constitutional government and economic progress.

From the reign of Muhammad Ali until the revolution of 1919, Egyptians had to consider the crucial questions: What is the cause of the decadence, and how can a revival or renaissance be achieved? Two major orientations emerged. The liberal modernist approach, inspired by Tahtawi, from 1820 onwards held that the selective assimilation of the European experience within the context of national sovereignty was the preferred path. A second orientation was to emerge decades later during the period of foreign intervention: the Islamic fundamentalist approach inspired by Mohamed Abdoh (1849–1905) held that to avoid the increasing decadence it became imperative to revive the fundamental principles of Islam: monism accompanied by justice.

# EMERGENCE OF CONTEMPORARY EGYPT

Thus, the stage was set for the emergence of contemporary Egyptian society and culture. The revolution of 1919 contained the seeds of both moderate national liberalism and radical populism. The overall balance of forces during the British occupation led to the emergence of the first option: the 1923 Constitution eventually granted to the Wafd (the Egyptian Nationalist Party) defined Egypt as an independent kingdom in the lineage of the dynasty of Muhammad Ali, while the military occupation proved that the protectorate had not ended. The radical option, as represented by the Wafd's secret organization (Abdel-Rahman Fahmy), was dismantled to the benefit of the official Wafd led by Saad Zaghloul and his supporters.

The year 1923 marked the beginning of the liberal modernist age, now rehabilitated, during which the foundations and formative institutions enabled the major schools of thought and action to promote the revitalization of Egyptian society and culture, which represented the first major stage of Egypt's national project in the twentieth century.

The basic economic structure remained, i.e. an essentially capitalistic agrarian economy. However, the rise of the urban middle classes opened new paths. From the onset, Talaat Harb's call for 'an Egyptian bank for all Egyptians' indicated that the new emerging classes intended to assume a role independent of the foreign investors. The foundation of the Misr Bank (1923) paved the way for the Federation of Egyptian Industries and the broad network of industrial and commercial institutions of the Misr group during the 1930s, whose activities ranged from textile to air transport and cinema. By the mid-1930s, the balance within the capitalist class began to shift, from the agrarian landowners (the 'feudal' sector) to the modern banking-industrial groups. New political forces emerged around the Wafd: the liberal-constitutionals and Saadist parties represented the big landowners and the industrial groups respectively. On the left wing were the communist and socialist parties, and these new radical forces competed with the traditional political establishment: Ahmed Hussein's Young Egypt, the New National Party, and the Muslim Brotherhood. The stage was thus set for a new national and social revolution.

In the midst of this bustling socio-economic evolution, culture and intellectual activity could hardly remain stagnant. The period between 1923 and 1952 can be defined as the 'golden age of liberal modernism', which precipitated in-depth transformation. The economic, social and political crises, and the resulting tensions and contradictions, led to serious repercussions in the realm of thought and culture. Each of the two major tendencies that took shape during the nineteenth century splintered into conservative and radical wings. The liberal modernist tendency was divided between a conservative wing, bringing together the minority parties concerned with social stability and the imitation of Europe, and a radical wing, which combined the goal of national liberation and independence with the demand for radical economic and social transformation as sought by the left-wing progressive parties, the youth movement and elements of the new national parties.

During this period of modern liberalism the main institutional basis for socio-economic progress and cultural renaissance was created. Thus, Fuad al-Awwal (now Cairo) University was founded as the centre of a network of scientific and specialist bodies including the Egyptian Geographical Society, the Royal Egyptian Agricultural Society, the Institut d'Egypte, the Egyptian Society for Statistical and Juridical Sciences, the Société des Amis de l'Art. Myriad organizations emerged during this period: the Egyptian national press (*Al-Ahŕam, Al-Mokattam, Al-Hilal, Sawt el-Umma, Al-Misrî, Al-Masawwar*), the Misr Bank group, the Federation of Egyptian Industries, the universities of Alexandria and Aïn Shams, publishing houses (e.g. Dar al-Maaref, Dâr al-Hilal), the Committee for Writing, the translation and publishing company Dar Nahdat Misr, and cultural periodicals such as *Al-Kâteb al-Misri, la Revue du Caire, Apollo*, and *Al-Rissalah al-Gadiidah*.

## THE ARTS

The period's exuberant economic, social and political activity fostered a burst of creativity in the fields of literature, the arts, philosophy, and natural and social sciences. This was the age of the emergence of the novel, which reflected the rise of urban centres in traditionally rural Egypt. Its major centres – Cairo, Alexandria, the Nile Delta cities (e.g. Tantah), Port Said – emerged as centres and settings for the Egyptian novel, although a certain rural flavour persisted. The initial strides made by Manfaluti, Ibrahim al-Mazni and Taha Hussein were taken to greater heights by Yehia Haqqi and Nagib Mahfuz. The younger novelists, led by Abdel-Rahman al-Sharqawi, belonged mainly to the progressive faction of the national liberation movement, while Ihsan Abdel-Qoddous' novels reconciled the romantic approach with the demands of the radical nationalists. The transition from the modernized traditional forms of the novel to a truly modern, incisive approach was the life achievement of Yussef Idris, widely considered the Egyptian Chekhov. To this day, the influence of Idris and Mahfuz contribute to the emergence of new perspectives for the Egyptian novel and short story. Both authors stand at the juncture of the liberal period and the age of radical transformation ushered in by the revolution of July 1952.

Among the principal exponents of modern trends are the poets Salah Abdel-Sabbour and Salah Jahine, and the playwrights Tawfiq al-Hakim and No'man Ashour. Similar advances in the field of music were achieved by Sayed Darwish, Om Kolthoum and Mohamed Abdel-Wahab. During this era, the thriving film industry generated more income that any other sector except the textile industry. Once again, the Misr group took the lead, promoting a generation of directors within the circle of Henry Barakat, who successfully adopted a romantic approach to social realism. The period's leading actors attained the level of Nagib Rihani, Yousef Wahbi and their disciples. Other noteworthy artists who shared this innovative movement include the sculptors Mahmoud Mokhtar, renowned during the 1919 Revolution, Gamâl al Segini and Adam Henein and the painter Hamed Abdallah. The Islamic fundamentalist tendency developed in two directions: the Muslim Brotherhood, founded by Hassan al-Banna in 1927, promoted traditional ideology among the peasantry and the urban and rural middle classes, via its organ

*Al-Da'wa*, while Sayed Qotb, representing the more moderate position, emerged as the leading theoretician. Abdel-Razzaq al Sanhouri made advances in the field of legislation on the basis of Islamic Shariah.

## NATIONAL REVOLUTION

The radical populist approach developed mainly in the political field, from the nationalist movement Misr al-Fatat, founded by Ahmed Hussein, and which gave rise to the Free Officers, the secret army organization founded by Nassar in 1952 for the purpose of overthrowing King Farouk I and liberating Egypt from Great Britain. It aimed at revitalizing the national movement in the pursuit of political and social goals. This became the message of the Free Officers six months after the Cairo fire of 26 January 1952, and the ensuing chaos under martial law, when the Free Officers took power, thus circumventing the united national front.

Under the leadership of Gamal Abd el-Nasser, Egypt underwent a national revolution (1952–64) followed by a social revolution (1964–70), which brought about the nationalization of the economy and the Suez Canal, followed by the war of attrition after 1967 that prepared the ground for the 1973 war. Under Anwar Sadat, the new economic policy launched in 1978 led to a general economic decline to the benefit of the new class of businessmen, mainly importers. The road to strategic development thus reached a bottleneck. Under Mubarak, attempts to limit the effects of globalization have proceeded with considerable difficulty.

The cultural field inevitably reflected these profound changes. During the early years (1952–67) until the October 1973 war, the liberal modernists witnessed the regression of their conservative sector and the rise of radicalism. Consequently, nationalism, anti-imperialism, Arab unity, and for a time socialism, came centre stage, while the Islamic fundamentalist faction gathered strength. From 1967 onwards, the rift between these two groups reached new heights. The 1967 military defeat weakened the national-progressive branch of the liberal modernists. Simultaneously, buttressed by the growing influence of the major oil producing countries, a wave of Islamic fundamentalism swept the population.

## AFTER 1967

Thus, the post-1967 period can be defined as the era of sociocultural conservatism and the growth of a populist Islamic movement, sometimes veering towards integrism, coupled with a parallel growth of Western-oriented modernization. The moderate position receded in favour of a rising wave of confrontations, fuelled by the Palestinian tragedy and related military interventions. As a result, a closer relationship developed between the two radical sectors of liberal modernism (nationalism) and Islamic fundamentalism (as distinct from integrism). While the liberal modernist current prevailed in the field of culture, the new novel, under the powerful influence of Nagib Mahfuz, was enriched by Gamal Ghitani, Son'allah Ibrahim and their peers. A new style of poetry combining romanticism with social realism emerged through the works of Ahmad Fuad Negm, Salah Jahin, Fuad Haddad, Ahmad Hegazi, Abdel-Rahman al-Abnoudi. Yet, theatre and cinema lagged behind owing to the overwhelming popularity of television. Nevertheless some important films were produced, such as Shadi Abdel-Salam's film masterpiece *Al-Momiaa (The Mummy)*, which exerted a great influence on his younger disciples. Alfred Farag pursued the social realist tradition in theatre, and Egyptian painting and sculpture reached maturity through the works of Hâmed Abdallah and Gamal al-Segini. The new Cairo opera house provided a suitable forum for music, opera and ballet.

In spite of a 50 per cent literacy rate, Egypt's school network and fifteen universities continued to grow. The fields of philosophy, geography and geopolitics, history, psychology and literacy criticism developed considerably thanks to such scholars as Abdel-Rahmân Badawi, Lonis Awad, Mahmoud Mandour, Gamal Hamdan, Galal Amin' Tareq al-Bishri, Mohamed Anis, Yousef Maurad, Mustafa Soueif, Mohamed Mandour, Ghali, Hakri and Ezzedhin Ismail. The groundwork in the field of Egyptian cultural history and philosophy had been laid by Sobhi Wahidah's philosophy, and Hussein Fawzi provided the chronological and general history of the national movement as documented by Abdel-Rahman al-Rafe'i.

From 1952 onwards, the role of the state grew in the field of culture education and the media. The state developed its dominance in education, while private and foreign institutions played a larger role especially at the university level. The newly created Ministry of Culture aimed at providing both a general orientation to cultural life and a network of institutions and activities capable of involving a large majority of aspiring intellectuals. The tremendous development of the mass media, and particularly television, occupied centre stage in public life. There was a rapid growth of information and creative thinking in the press. Soap operas proliferated on television after the era of social realism (1973–85), as the once-important Egyptian cinema declined.

From 1978 onwards, the impact of globalization was acutely felt in the spheres of economy, society, culture, and policy orientation in general. The values system of modern Egyptian society, deeply rooted in its long and illustrious civilization, suffered as a result of this process. The traditional collective spirit gradually gave way to individualism. The market economy revealed the predominance of imports and oil revenues. The effects, particularly the introduction of foreign global models, were felt primarily in the modern urban areas and eventually in the rural areas as well.

In reaction to this unprecedented transformation, Egyptian society and culture underwent a revival of national culture, deeply intertwined with its national and revival movements. Hence there emerged a confrontation between foreign penetration and the deep attachment to the Egyptian nation and its distinct identity. Thus globalization has prompted the resurgence of a desire to affirm a national identity as well as creativity in the sociocultural field.

The resurgence of the national dimension in the field of culture and in the society at large brought to the fore a hitherto unknown level of contradictions between the two major schools of thought in contemporary Egypt, i.e. liberal modernism and Islamic fundamentalism. The former,

bringing together the national radical and progressive schools of thought and action, felt that it was better to face globalization, while the Islamic fundamentalists considered that the deeply rooted popular culture would resist globalization. The growing polarization between the two schools was fostered by a complex network of regional and international influences that were foreign or inimical to the traditional centrist identity.

More recently there has been growing dialogue between large sectors of these two orientations, a process prompted by the rising tide of aggression from Suez to Palestine and Iraq. Proceeding from the pioneering socialist thought of Salamah Musa and Shohdi Attiyah, a new generation of national-radical political thinkers and experts emerged around Ahmad Bahâ Eddine and Mahmad Heykal. This new trend is also reflected in the modernist Islamic political writings of Tareq al-Bishri, Ahmad Kamal Abul-Magd and Selim al-'Awwa. In addition, a new generation of publishers and periodicals gave expression to this renewal. The General Egyptian Book Organization and the publisher Dar al-Shorouk collaborated with the previous generation of publishers and with influential periodicals such as *Al-Taliah*, *Woghat Nazar* and *Al-Fousoul*. The national democratic orientation as defined in the 1940s, particularly by the National Committee of Workers and Students, continues to provide inspiration for advocates of this trend.

More then ever, the question of identity has emerged in recent years. The crisis of the project for Arab unity gave rise to a search for a distinctly Egyptian identity with both Pharaonic and Islamic components. One-sided hegemony raises new questions about Egypt's cultural future: is Egypt proceeding along its pro-Western orientation? Or is it looking towards the East, consistent with its history and geopolitical context, as expressed in the Non-Aligned Movement of the 1950s.

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# 34.8
## THE SUDAN

### *Saidou Kane*

**COLONIAL SUDAN:
THE CONDOMINIUM**

On the eve of the First World War, the Sudan region offered the occupying power several geostrategic advantages owing to its location among its neighbouring countries: Chad and the Central African Republic to the west; Libya and Egypt to the north; Kenya, Uganda and the Democratic Republic of the Congo to the south; and Eritrea and Ethiopia to the east. This pivotal position led to a strategy of occupation that took the form of the Anglo-Egyptian Condominium.

In 1914, the Sudan constituted a mosaic of peoples, subdivided (as they are at present) into distinctive geographic entities. The north was entirely Muslim – and for all practical purposes, a part of the Egypto-Ottoman world – whereas the centre was more mixed and dominated by Islamicized but not necessarily Arabicized populations. In the south (where traditional African religions remained strongly implanted) and in the central mountain regions lived pagan and Christian populations, including the Dinka (population: 2 million) and the Nuer (500,000), who led a nomadic existence in the basin of the Upper Nile and the Nuba (500,000), a farming people who occupied the central hills. While the Bagarra, a black pastoral people inhabiting the central regions and practising transhumance, are Arabicized today (although their numbers include some assimilated Fulani), this is not true of the nomadic Beja camel herders (population: 500,000) who inhabit the mountains flanking the Red Sea.

In the country's various agro-ecological zones, the subsistence economy, which is inseparable from the social structures, was underpinned by basic social structures characterized by endogamy. The human environment was organized according to permanent base villages.

In the north, traditional know-how in relation to food production, handicrafts and monumental art has survived. Upon their arrival in the region, the European colonists encountered irrigation techniques that predated those they would employ in the inter-war period for the development of the Gezira (the 1925 concession agreement). The Archimedean screw (*shaduf*), the *sāqiya* (a water wheel turned by animal traction) and irrigation by flooding the basins of the main branch of the Nile are age-old techniques, perennial irrigation being introduced by the British. Land tenure was largely personal (*mulk* in the region of the White Nile). Joint ownership was the rule as in other African agricultural civilizations in which only usufruct was allowed, the land itself being inalienable.

In order to avoid stirring up Muslim fanaticism, the British administration banned Christian missionaries from working in the north. It authorized such activity in the south, where the Christian churches set up primary schools using African languages and English for instruction.

Until 1939 the policy of indirect administration (Indirect Rule or Native Administration) enabled the administration to thwart popular uprisings, immobilizing the rich multicultural reality in fragmented localities. The new approach involved the recruiting of docile and apolitical intermediaries and the celebration of local cultures with the aim of restricting the influence of the urban elite, inhibiting its anti-colonialism and preventing its association with Egyptian pro-independence circles (1924). All northern influence was excluded from the south and vanished tribes were resurrected. Anthropologists (e.g. Evans-Pritchard) were set to carry out this work in the south. English was used in the south instead of Arabic, and the region remained cut off from the north until 1946.

At the outbreak of the First World War, the British exploited and aggravated the antagonisms between the different brotherhoods, setting Sayyid ᶜAbd al-Rahmān al-Mahdī (descendant of the Mahdi), the leader of the Mahdiyya, against Sayyid al-Mīrghanī, the leader of the Khatmīyya.

This situation helped to radicalize the struggle against the British presence, which was organized with the support of the Egyptian national movement, led by the Wafd party of Saᶜd Zaghlūl (1857–1927). This movement had close contacts with some members of the new Sudanese intellectual elite. An opposition movement in the army was crushed, and the Egyptian soldiers expelled.

The division of the country into a north where more respect was shown for the culture and a south wrenched away from its religious and cultural traditions would come to a dramatic climax in August 1955 with the beginning of a civil war that lasted 17 years.

## THE AGE OF THE NATION STATE

The emergence of a modern, independent Sudanese state was far from certain in view of the existence of conflicting trends of opinion that favoured, on the one hand, the union of Sudan with independent Egypt or, on the other, a separate identity for the country. The unilateral declaration by which the King of Egypt proclaimed himself 'King of the Sudan' in 1951 and granted the 'province of the Sudan' a certain degree of autonomy created serious problems for the entente between the British, Egyptians and Sudanese. This decision created unanimity against the union of the Sudan with Egypt. The British, in some difficulty, then endowed the Sudan with autonomous institutions, which swiftly proceeded to vote in favour of independence, which was proclaimed in January 1956.

The Sudan's major problem thereafter concerned its unity (the issue of southern Sudan), the nature of its state power (Islamist, since 1989) and the modernization of its political, socio-economic and cultural structures. The Sudan gradually developed education, the arts, science and culture and is increasingly giving women their place and paying greater attention to literacy education and the promotion of the press and media, even if, at present, these forms of social communication are almost entirely under the control of the state monopoly. The increasing use of the Arabic language also contributes significantly to communication and integration. However the status of the other national cultures has still not been properly re-examined.

## THE DEVELOPMENT OF EDUCATION AND WOMEN'S EMANCIPATION

The British administration trained many auxiliaries. In Khartoum, it established the Gordon Memorial College. The watchword was to avoid turning out 'intellectuals', who were 'a source of trouble'. This school would eventually become the University of Khartoum. At Omdurman, a school of Muslim law – the future university – was founded. It focused on a form of Islam without Mahdism. The modern instruction introduced by the British was theoretical. Nevertheless, it gradually developed into the main vehicle for social advancement and access to administrative positions. Since independence much effort has been devoted to increasing the number of schools and often teachers have become community leaders in the villages.

Education for females began more recently. A private college for women was set up just after independence, and girls were first admitted to the University of Khartoum in the 1959/1960 academic year. Since then, a university for women has been created. The role and place of Sudanese women may be measured by their degree of integration in the education system and the labour market. Their presence is most evident in the area of education, handicrafts and administration. They predominate in the health sector and are also represented in a majority in the liberal professions. Islamic law studies dominate the curriculum at Omdurman University, which admits students from the *khalwas*, the traditional Qur'anic schools. Two other universities have opened more recently, in Juba and Gezira, the latter being specialized in agricultural studies. The Khartoum Technical Institute offers university-level technology training. In 2001, the literacy rate in Sudan was 78.1 per cent, and education is free of charge. However, the civil war brought about the collapse of the school system in the south regions.

An Institute of African and Asian Studies, established after independence, has published a great deal of material on the history, sociology and daily life of people in the Sudan. The Arab Centre for Education, Culture and Science, which opened in 1977, is devoted to Arabic language and philology studies. The Sudan National Museum in Khartoum possesses collections relating to the region's prehistory and the period of the Napata, Meroe, Kush kingdoms that were contemporary with ancient Egypt. The Khalifa's House in Omdurman contains a collection of relics from the Mahdist period of the nineteenth century. Khartoum also has museums devoted to natural history and ethnography. The University of Khartoum Library is renowned for its collection of Sudanese and African traditional objects; the Flinders Petrie Library (named after the renowned Egyptologist) and the National Records Office hold a large collection of historic documents.

## LITERARY AND ARTISTIC LIFE

Sudanese literature has been shaped by oral culture and the written word. Ancient chronicles still exist such as those produced during the sixteenth-century Funj Kingdom. The Tabaqa of Sennar, which relate the lives of the Muslim saints of Sennar, dates from the early nineteenth century. Modern Sudanese poetry has been strongly influenced both by English romanticism and classical Arabic literature. On the eve of the First World War, Sudanese poetry played an important role in the search for a Sudanese national identity as illustrated by the literature of Tambal: 'the poetry written by a Sudanese poet, the manifesto of an entire generation, should reflect Sudanese sensibility and the Sudanese landscape'.

From 1932 to 1973, the literary review *Al-Fajr* brought together young poets devoted to promoting the country's literature, including the engineer, diplomat and writer Yusuf al-Tinni, and Al-Tijani Yusuf Bashir, who in the course of his tormented 27-year existence became one of the greatest Sudanese romantic writers. The following generation were supporters of the Third World and pan-Africanism. They launched the review *Les tempêtes révoltées*, which featured Muhyi al-Din Faris and Mubarak Hassan among others. They were closely followed by Abdallah al-Tayeb and Muhammad al-Mahdi al-Magzub, who broke the rhythms of traditional Sudanese folk poetry. Sudanese villages provide the setting for novels such as *A Season of Migration to the North*, which mixes Arabic with the languages of Darfur. Tayeb Salih, Rauf Mussad and Jamal Mahjub, now in exile, head the list of great contemporary writers.

In the realm of the arts, Sudanese music, based on the extremely rich traditional genre known as Maqam, is currently undergoing modernization. It is experiencing a renaissance under the influence of modern Egyptian and Western instruments. Sudanese vocal art, directly influenced by Arab music, is renowned for its extreme melodic sophistication. Today, Sudan's traditional and classical music genres are under threat by the mass media and globalization. At the same time, the oral tradition remains one of the essential sources of Sudanese music, particularly in the southern regions, where it is firmly embedded.

## THE DEVELOPMENT OF MEDIA CULTURE

Media culture, which remains under state ownership, has affected all aspects of Sudanese culture. Radio broadcasting, which began in Sudan in 1938, is largely credited with opening up the entire country to modernity by targeting the traditional communities as in all the Arab-speaking countries of Africa. Its programmes, broadcast throughout the country, greatly contributed to the spread of the Arabic of Omdurman.

Television was introduced in the 1960s, enabling images to reach the smallest villages along with a plethora of melodramatic Egyptian films. Among Arab countries, Sudan has remained greatly dependent on Egypt with regard to the cinema and in other areas of media culture. The press and publishing are developing as the cultural sphere expands, the most widely read newspapers being *Al-Ayam*, *Al-Sahafa* and the English-language monthly, *Sudanow*.

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# 34.9

## THE MAGHREB
## LIBYA, TUNISIA, ALGERIA, MOROCCO, MAURITANIA

*Saidou Kane*

## MAGHREB SOCIETIES (1914–1954)

Well aware of Europe's expansionist ambitions, Morocco and the countries of the former Ottoman Empire in North Africa (Algeria, Tunisia, Libya and Egypt) experimented with all forms of European-inspired modernization (e.g. the Tanzimat reforms in Egypt) to prevent the direct colonization of their countries, which were deemed 'backward and therefore suitable for colonization'. Consequently, customs and institutions attempted to integrate the distinctly Western concepts of constitutionalism, exercise of civil liberties, secularization of justice, liberty of thought, secular education, etc. The reformers acknowledged Europe's superiority not only in technical matters but also in numerous other fields, except religion.[1]

The far-reaching liberalization demanded by Europe resulted in the destruction of the Islamic legal system. The community dimension of Islamic law (protection of collective property, guarantee of a just wage, condemnation of usury) was seen as a barrier to the new property and commercial speculation.[2] However, neither reform programmes that reduced the authority of the independent state and enriched the foreigners, nor the settling of the debts contracted by local governments could prevent the progressive occupation of the countries of the Maghreb by the colonial powers claiming to ensure more effective protection for European investments in those countries. The economic and legal means that made vassals of the countries of the Maghreb at the end of the nineteenth and the beginning of the twentieth centuries was the prelude to military violence that persisted until the mid-1930s. For over a century, the project to colonize the Maghreb had been the centrepiece of the strategy for the replacement of the local Ottomans in north and north-east Africa.[3]

## DISMANTLING OF TRADITIONAL SOCIETY

Colonization brought about the reorganization of the Maghreb region and greatly affected the condition of its inhabitants and their relation to the social and cultural environment. The policy of settlement in Algeria, the protectorate in Tunisia and Morocco, and the more or less direct colonization of Mauritania and Libya were accompanied by development and industrialization that paved the way for dispossession and the confiscation of land, as well as the loss of key aspects of society and culture in the Maghreb.

The region's population quadrupled in less than a century. From 1936 to 1947, the urban population of Morocco grew by one million. In Tunisia, urbanization increased from 23 to 32 per cent between 1921 and 1956; in Algeria, the urban population doubled from 1936 to 1954.[4]

### Changing lifestyles and culture

The new urban structures and the sociocultural, educational and transportation infrastructure of colonial society rapidly altered the lives of town-dwellers. Cities modelled on principles of European town planning were built alongside existing traditional towns, which became the 'medinas', or historic centres, of these hybrid urban structures. The modern city of Fez, built alongside the old city by the French Resident-General Lyautey, best exemplified this modernizing trend.

The different layers of society that were drawn to the new urban lifestyle contributed to the severing of traditional community relations. For example, women enjoyed greater freedom in the towns, which facilitated looser marital ties than did the lineal, clan or tribal system of the less urbanized areas. In the towns, the elite, trained at the modern education institutions, looked forward to the Westernization of their society and to a new interpretation of Islam better suited to modern conditions. The traditional elite, or *ulama*, crystallized aspirations for a form of modernization free from foreign domination, along the lines of the modernist Arab-Islamic reform culture proposed by Jamal al-Din al-Afghani (1839–1897) and Muhammad Abduh (1849–1905).

## Challenging the colonial order

The frustration resulting from the cultural and economic loss inherent in the colonial process served to foment the ideas of pan-Islamic nationalism between the 1920s and the 1950s. Some national movements and parties, distant echoes of the 'Young Tunisian' and 'Young Algerian' movements of the beginning of the century, dealt colonization some heavy blows. Among the early anti-colonial movements: the Entente for National Liberation, the Association of Ulama of Ben Badis, the Étoile Nord-Africaine led by Messali al-Hajj, and the Évolués of Ben Jelloun and Ferhat Abbas, in Algeria; the Neo Destour (New Constitution) Party and the Union Générale des Travailleurs Tunisiens, in Tunisia; and the Istiqlal party, in Morocco.

## The new Maghreb: scientific and technological development and cultural renaissance

The northern Maghreb is one of the rare regions of the globe where French colonialism had the resolve to put in place the structures essential for the development of a modern economy. Nevertheless, French policy failed to satisfy the requirements for the internal development of modern states, and it could be argued that it even produced certain handicaps in the form of obsolete equipment left behind by the colonizers.

The cultural renaissance was enriched by the osmosis between the traditional Maghrebian cultures and the European heritage. This dual tradition was noteworthy in the fields of the arts, literature and architecture through which the Maghreb sought to restore the historical links that had been severed for more than half a century. The Maghreb refocused its attention on the traditional Earthen habitats known as *ksour* (Matmata, Tatouine, Takrouna, Toggourt, Ouadane, Chinguetti, Ksar Hadada, etc.) and the architecture of the northern cities (Tlemcen, Fez, Algiers, Tunis, Constantine).

The Maghreb also revamped and redeveloped other components of its cultural heritage, including the weaving of carpets, and other traditional woven crafts such as *mergoums* and *bakhnougs*. So successful was Tunisia in rejuvenating such crafts traditions that it assisted Mauritania in reviving its tapestry production by providing training grants. Algeria rediscovered Berber music, particularly from Kabylia, through the rai movement.

Theatre, which appeared in the Maghreb during the period between the two world wars, developed rapidly. The author of the acclaimed novel *Barrage* (1940), Tunisian writer and former education minister Mahmud Messadi, paved the way for a literature of the Maghreb free from the strictures of foreign influence.

Born in Egypt in 1917, the Arab cinema continued to be dominated by melodramas, musicals and comedies. The arrival of the talkies stimulated film production, and anti-colonial themes first appearance around 1952. The Maghreb made its mark in the motion picture industry in 1958 with the film *Goha*, shot in Tunisia by Jacques Baratier from a screenplay by Georges Schéhadé. It was not until independence, however, that the Maghreb turned to anti-colonial themes. Clearly the Algerian War became a predominant theme. The Algerian Lakhdar Hamina Mohamed gave a boost to the Algerian motion picture

industry with his film *Le vent des Aurès* (1965–66). In *Les mille et une mains* (1972), Moroccan filmmaker Souhayl Ben Barka revealed the sufferings of the workers toiling in the dyers' souk of Marrakech and offered a new perspective on the increasing social problems. In 1975, Lakhdar Hamina returned to the screen with *La chronique des années de braise*, which depicts the tribulations of the Algerian people. In 1972, anti-immigration xenophobia in France was explored by Mauritanians Med Hondo (*Les bicots, nègres, vos voisins*), and Sidney Sokhna (*Nationalité: émigré*).

Twentieth-century Maghrebian literature acted as a catalyst for analysing the evolution of societies resulting from the fusion of components from the West, the Arabic-speaking world and sub-Saharan Africa. Commenting on the *nahda* or Arab renaissance, the Egyptian intellectual Anouar Abdel Malek draws attention to the very rapid development of a distinctly Arab culture reflected in conceptual vocabulary, the style of expression and the rhythm of the language. In this regard, after the First World War, the great writers of the older generation (e.g. the Tunisian poet Shabbi) continued to exert an influence on the literature of the Maghreb. Moreover, the 1960s generation of writers – Abdellatif Laabi, Kheireddine and Tahar Ben Jelloun (Moroccan), Mahmoud Messadi (Tunisian) and Jean Amrouche and Kateb Yacine (Algerian) – became the spokesmen for those without a voice. The autobiographical novel of Mohamed Choukri, *Le pain nu*, which was banned for 17 years by the Islamic establishment because of its radical denunciation of certain relationships between parents and their children, delighted anti-conformists. Mohammed Dib, Malek Haddad, Kateb Yacine, Assia Djebar, Rachid Mimouni and Rachid Boudjedra in the north, and Tène Youssouf Guèye, Jémal Ould Hassan and Ahmedou Ould Abdel Kader in the south of the Maghreb, echoed the hopes and contradictions of a society in search of its roots and its place in the Arab-Muslim, African and modern world.

Towards the end of the twentieth century, the media culture began to monopolize the spoken word in the Maghreb. From ascetics to troubadours, from politicians to men and women of culture, the leading players in society expressed themselves essentially through the press, radio and television, but means of communication continued to be tightly controlled by the state. The transistor radio, which appeared in the Maghreb in the 1960s, increasingly gave way to the new medium of television, which was implanted in nearly all towns, villages and encampments. These media are expected to enable the Maghreb to emerge from centuries of backwardness.[5]

## NOTES

1.      J, Ganiage, *L'Expansion coloniale de la France sous la IIIe République*, Paris, 1968, p. 162.
2.      A. Laroui, *L'Histoire du Maghreb, un essai de synthèse*, Casablanca, 1995, p. 234.
3.      A. Laroui, op. cit., pp. 304–22.
4.      H. Isnard, *Le Maghreb*, Paris, 1966, p. 58.
5.      M. Chelbi, *Culture et Mémoire Collective au Maghreb*, Paris, 1993, p. 211.

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# 34.10
## CONCLUSIONS AND ORIENTATIONS

*Anouar Abdel-Malek*

To be sure, all areas of the non-hegemonic Western world, from the sixteenth century until the late twentieth century, have been made dependent on, and even occupied by, Western powers thereby leading to uneven development and marginalization. Yet the Middle East continues to experience protracted waves of aggression coupled with concerted isolation, from the early Crusades until the present day via centuries of colonialism and imperialism. The wider region of the Middle East witnessed the gradual weakening of ancient civilizations, cultures and empires – a process which has left a deep imprint on the entire region, albeit with different levels of intensity. It follows that a serious study of the wider Middle East today has to take into account the overall cultural and societal crises caused by protracted aggression and dependence. Hence, the specific nature of the problem, which each and every society of the Middle East must face. At the heart of the matter, lies a two-part question: What is the cause of the decadence, and how can a revival or renaissance be achieved?

A first wave of questioning began, quite naturally, from the comparison between the West, mainly Europe, and the Middle East. European modernity was closely linked to a perception of the human environment by means of rationality, the satisfaction of human and societal needs, and the convergence of scientific, industrial and bourgeois democratic revolutions. Hence the first part of the answer: the decadence of the Middle East can be seen as the direct consequence of the incapacity of their societies to understand, and benefit from, the processes and achievements of European modernization. Decadence could only be overcome through the imitation of the advanced world. This modernist orientation was predominant during the first half of the nineteenth century.

After the 1840s, however, Europe began its onslaught on the Middle East region, particularly on the southern and eastern shores of the Mediterranean. Finance capital buttressed by direct military interventions revealed the limits of the liberal-modernist orientation. If a partnership could not be achieved by imitating the West, it was necessary to seek a more convincing answer to the two-part question raised above. Gradually, influential thinkers and activists committed to preserving the major societies of the Middle East felt that the immersion in their cultural roots would provide the required answers. Since the seventh century AD, these roots were mainly Islamic, yet, Islamic societies were now perceived as decadent.

Centuries of decadence resulted from allowing centuries of dogmatism, deformations and dead weight. Hence the path to a renaissance: the return to original truths and to the very foundations of Islam would clear the way for a genuine interaction with modern times, based on a careful and unrelenting use of common sense. Such was the path defined by the Islamic fundamentalists. However, their position was firmly rooted in the belief that orthodoxy was the only ideology appropriate for the Ummah, or the Muslim community as a whole.

By the early twentieth century, national independence movements struggling against foreign domination were consolidated as Western imperialism sought to divide West Asia and the Arab nations by proceeding beyond penetration and occupation. The First World War led to the Balfour policy in Palestine, the Sykes-Picot agreement to divide the Middle East between Great Britain and France, the amputation of Turkey, as well as the US control of the oil reserves in the Arabian Peninsula and the Gulf region, as well as in Iran. Thus the Middle East was forced to bear the brunt of direct imperialist occupation and rule. Hence the differentiation of each of the two orientations into a conservative and radical wing, thus opening the path towards a united national front dedicated to liberation, democracy and social justice. Eastern societies in the Middle East, having thus become the centre of the rising tide of tensions, were bound to enact measures enabling them to take action. Quite naturally, these measures were implemented at the national level.

In the Arab world, the notion of the two-tiered nation gradually emerged, particularly at the time of the rise of the Arab national unity movement in the mid-1950s. The first level was defined as the actual status of concrete national societies, the recognized nations of the international community. While the second level brought together all national units in the wider circle of their common cultural context. On the other hand, the wider cultural historical circles of Iran and Turkey were perceived more as a socio-cultural area than as a regrouping of different national units.

Such were, and still are, the complex processes at work at the very heart of Middle Eastern societies. Yet, there seem to be additional factors that can explain the exceptionally

acute nature of processes now unfolding at the socio-cultural level. This can be understood in terms of the dialectics between the surge towards modernity and resurgence in the most complex geopolitical areas of our times, with great tension between specificities and universality.

How could historical positivism be secured and sustained in light of the relentless pressure of external negative factors? Quite naturally the level of the superstructure – ideas, beliefs, values – appeared more capable of providing a positive outlet. Education – from the eradication of illiteracy to the creation of centres of academic learning and scientific research – was, and remains, the most visible weapon against centuries of isolation and regression. The questions of national defence and security had to be faced simultaneously with the vital requirements of socio-economic development and cultural modernization.

Thus, the march towards a national society and cultural modernization proceeded despite great constraints. From the onset, the development of infrastructures at the national level required clarifying certain contradictions throughout the Middle East: the dialectics of specificity and universality, centring on the quest for a clear vision of national identity in all societies of the region, albeit with different degrees of urgency.

The quest for a clear vision of national identity emerged as the direct consequence of the region's historical processes. The decline of the Ottoman caliphate, with its centre in Turkey, led to the emergence of a series of new states in the Arab Near East and North Africa. These national states had been ruled as provinces of the Ottoman Empire until the new borders were drawn up by the victorious Allied powers after 1918. Thus Turkey emerged from its war of independence as a sovereign national state ruling a much-reduced territory. New states were created, either as the restoration of previous historical formations, or more often as the creation, literally, of new political entities mainly from the Arab Near Eastern hinterland to the Persian Gulf. Hence the quest for the greater circle of national cultural identities: the Arab nation, in the Near Eastern sector of the Arab world; as well as the orientation towards the wider historical geo-cultural areas of Turkey and Iran in West and Central Asia; the greater Maghreb North Africa; and the Nile Valley union.

Having taken stock of the present situation in the Middle East helps us to examine the questions about the future with a degree of realism and clear-sightedness.

The future raises the question of feasibility in the new global environment. To be sure, the incorporation of the Middle East in the globalization processes, albeit with severe difficulties, can strengthen this vision. Yet, questions abound as we explore the concrete processes. How would the optimal model of economic modernization and development be defined? Obviously, the liberal, or neo-liberal, model can fail to address the very different processes and factors at work in the societies under study. However, since the traditional centralized economy does not provide the required flexibility, original models of development, bringing together the private and public economic sectors in various configurations, are required. Those working in the economic field would like to give priority to the major ongoing modes of accelerated development and societal transformation, now being implemented with unprecedented success mainly in East Asia, and in certain parts of Latin America. Similar developments will occur in the cultural

sector. To address these questions, these countries must ensure the training of new types of cadres, thinkers and actors, who must be future orientated while at the same time maintaining a genuine respect for living traditions in a modern context.

The dialectics of universality and specificities lies at the very centre of any meaningful analysis of concrete societies. Differences between the centre and peripheries often brings to the fore the notion of *exceptionalism* – as if the East, including the Middle East, could not be understood owing to its 'exoticism'. Such are the difficulties in studying Western societies. A first attempt to bridge the gap between the Western and Eastern cultures leads us to study their differences. From the onset, this approach of studying differences, while leading to a better definition of quantitative differences, fails to examine the complex factors that explain the wide panoply of differences within the all-encompassing global unity of humankind. Briefly stated, the study of difference attempts to bring together societies formed by vastly different, geo-historical conditions. However, the major difference between advanced societies and marginalized developing societies resides in the fact that the advanced developed societies have access to 'historical surplus value', while developing societies had, and still have, no access to such privileged conditions.

Hence the need to seek a more meaningful mode of understanding differences with a view to identifying points of convergence. This explains the urgent search to define a new model on the part of the innovative thinkers and activists of developing nations, particularly in the Middle East and Latin America. This search led to the elaboration of the concept of specificity in the 1960s and 1970s.

Characteristics shared by all societal formations are: the production of means of subsistence (economy), the continuity of human life (reproduction), social power (the state), the relation to time (transcendence: philosophies, religions). Societies structured around these four common dimensions vary according to their geographical and geo-political context through history. Obviously a nomadic society existing in a peripheral geo-political location over a relatively short period of time is profoundly different from a stable agricultural society whose major urban and social power centres are located in a sensitive geo-political area. Thus, the distinctness of any given society could be defined on the basis of its geo-historical formation rather than its postulated spiritual disposition. Thus it is necessary to recognize the specificity of the peripheral developing societies, as well as the specificity of each and every advanced developed society. The bridge was thus built to make sense of the dialectical differences and tensions within our common world, enabling all concerned to seek areas of convergence while avoiding destructive confrontations.

The recognition of specificity prompted a deeper examination of the values and goals of advanced patterns of development. If peripheral societies cannot aspire to joining the ranks of advanced societies in the near future – as is the case in most parts of the Middle East – perhaps the values and aims of advanced societies, mainly in the West, differ from those of Middle Eastern countries. In other words, could there be different modes of development leading to different goals in spite of the reputedly universal nature of fundamental values? This questioning arose in societies with a long history of progress and crisis. They were related

to but not directly influenced by societies that came to prominence after the age of maritime discovery, the Renaissance and the scientific and industrial revolutions. Most of the Middle Eastern societies are keenly aware of their past. Hence their tendency to reflect on the role of civilization and of their being part of major cultures that laid the foundations of the modern Western world. Thus, the search for alternative aims, values and projects emerged as the very foundation of possible futures for the West-Asian and Arab societies and as an alternative to a mere imitation of the dominant socio-cultural patterns. And this search quite naturally gave prominence to ideas and values beyond more restricted material and economic considerations. Thus the search for alternatives centred on the level of civilization.

This major orientation has taken place at a time when a sense of crisis seems to pervade the contemporary Western world. Major fratricidal and world wars, serious incidents of racialism and intolerance, coupled with the unpredictability of economic development, increasing self-questioning in the West, division rather than agreement appeared to constitute the very texture of the twentieth century, at a time marked by the rise of a renewed self-assertiveness on the part of Eastern societies and national liberation leading towards renaissance.

The 'civilizational' orientation of Middle Eastern societies is gaining momentum at this historical period when social thinking in major centres of the world stresses the role of civilization in contemporary ideas and projects, in light of nuclear and ecological threats, with the objective of peace and harmony in the world. In this context, the ongoing development processes of West Asian and Arab societies demonstrates a determination to aspire to a type of modernity that combines the notion of cultural heritage with the economic, scientific and technological requirements for contemporary developments. In this quest, communitarianism and solidarity occupy a central role in opposition to confrontation, individualism and hegemony. Human values, a normative approach, religion and philosophy take precedence over material achievements.

This 'civilizational' orientation can enrich the processes of bringing different civilizations and cultures together. Yet, the forging of the new world is now proceeding along dangerous confrontational paths. Challenge can give way to promise, should optimal time be allowed for West Asian and Arab societies to advance peacefully towards achieving a more advanced degree of modernity with respect to the specific nature of their cultures.

As ever, time is of the essence – 'time, the refreshing river' (Joseph Needham).

# 35

## SUB-SAHARAN AFRICA

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### INTRODUCTION

This chapter covers the main trends in the scientific and cultural development of sub-Saharan Africa in the twentieth century. At the beginning of the century, Africa was dominated by the colonial powers – Great Britain, France, Portugal, Germany, Belgium, Italy and Spain. The area under British rule included: Nigeria, the Gold Coast (Ghana), Sierra Leone and the Gambia in West Africa; Uganda and Kenya in East Africa; Nyasaland (Malawi), Northern and Southern Rhodesia in Central Africa; the four colonies of the Cape, Natal, Transvaal and Orange Free State, as well as Basutoland, Bechuanaland (Botswana) and Swaziland in Southern Africa. France controlled a large area known as French West Africa, including Senegal, Mauritania, Mali, Guinea, Cote d'Ivoire, Dahomey, Upper Volta, and Niger; and the smaller French Equatorial Africa (Chad, Gabon, Middle Congo and Central Africa). The Germans held German East Africa, Kamerun, Togo and South-West Africa. Leopold, King of Belgium, and his associates managed the Congo Independent State as a private venture until scandals about the ruthless methods of exploitation forced the Belgian state to take control in 1908 when it became the Belgian Congo. The Portuguese retained Angola, Mozambique, Cape Verde, São Tomé and Principe and part of the Guinea Coast in West Africa. The Italians occupied Eritrea and shared the Horn with the British and the French. Spain controlled the island of Fernando Po and the stretch of the coast around the mouth of Rio Muni. Even Ethiopia and Liberia, which managed to remain independent, were under the shadow of the colonial powers that dominated their neighbours.

At the end of First World War, the victorious Allied powers decided that the Germans had proved morally unworthy to rule Africans as a result of the brutalities in the suppression of the Maji Maji revolt in East Africa and of the Herero in South-West Africa. The main accusations were flogging, forced labour, bloody suppression of rebellion, 'barbaric destruction of tribes' and the arming of

Africans. These claims related mostly to events before 1907, when a supervisory Colonial Office was established to carry out reforms.[1] Although the Allies committed acts as atrocious as those carried out by the Germans, the victors occupied the German colonies, and proceeded to distribute them: Togo and Kamerun went to the British and the French; German East Africa to the British, who took Tanganyika, and the Belgians, who henceforth controlled Ruanda-Urundi; South-West Africa was governed by the Union of South Africa. The year 1918 thus marked the end of the process of conquest and partition and ushered in the concepts of 'trusteeship' and 'mandates' to be supervised by the League of Nations, a responsibility that was passed on to the United Nations after the Second World War. Despite this, the post-Depression rise of fascism in Europe tightened the grip of racism in colonial Africa, producing a new wave of immigration of poor whites into Angola, Mozambique and Eritrea, the Italian invasion and conquest of Ethiopia, and the doctrine of apartheid in South Africa. But it also led to the rise of militant nationalism in Africa and hastened the demand for independence.[2] Colonial domination persisted until the 1960s, that is, for two-thirds of the century, before political independence began to be conceded to the states created by the colonial powers. Even afterwards, the colonial legacy remained a powerful factor in the development of Africa. It will be necessary, therefore, to discuss the scientific and cultural development of Africa in three parts: (i) the policies and strategies of the colonial powers; (ii) the aspirations of the African peoples as enunciated in the struggle for decolonization and independence; and (iii) the policies and programmes of the post-independence African states.

Development, defined as changes in the social, economic and political life that result in improvement in the overall well-being of society, is widely considered to be the goal of all governance and social life. Scientific and cultural developments are interrelated strategies in the pursuit of overall development. Cultural policy involves defining the

strategies necessary to promote the human resources and way of life to enhance the development of the necessary skills and technologies. It is thus essential that science and technology be seen as integral parts of the culture so that, in promoting culture, science and technology can be enhanced, and vice versa. Every society and every culture has some level of science and technology that sustains it, particularly in the fields of agriculture and food production – including animal husbandry, hunting, fishing – and health care. There are science and technology also in various crafts and economic activities such as glass-working, weaving, pottery, gold and silver smithing, metalworking, etc. Science and technology are promoted through education, apprenticeship, religion, trade and other forms of social interaction and exchange. It is true that significant advances in science and technology are sometimes made in periods of crisis and national emergency, but they flourish best in an atmosphere of freedom where human dignity and cultural identity are encouraged, and enterprise, initiative and innovation are promoted. Since colonial domination, by definition, denies such an atmosphere of freedom and enterprise, it implies the very negation of development. Yet, it was under colonial domination that Africans had to seek development during most of the twentieth century.

In the pre-colonial period, most African societies welcomed trade with Europeans, Arabs, and Indians (particularly in Eastern Africa). Through its commercial relations with Egypt, Axum adopted the Coptic Orthodox Christian religion in the fourth century, using it as a means to establish some cultural unity over the Ethiopian plateau. The Church, under the leadership of the emperor, promoted education especially among the clergy and the ruling classes. This included not only literacy and advances in agriculture, but also some remarkable achievements in art and architecture, including the stone churches that are now inscribed on UNESCO's World Heritage List. The Arabs conquered North Africa, including Egypt and the Nile Valley, and gradually penetrated into the Western Sudan through trading (primarily slaves but also gold and ivory). Islamic culture promoted art, architecture and scholarship. It rediscovered the science of the ancient world, that of the Greeks and Romans that was much influenced by Egypt, and which the Islamic universities developed and propagated. The flowering of Islamic culture in the Sudan belt in the nineteenth century through a succession of jihad movements, beginning with Sokoto, spreading to Massina and the Tukulor, to the Mahdist state in Khartoum, set the stage for cultural development in the twentieth century. Islamic movements continually threatened the Christian state of Ethiopia. This persistent threat made cultural, scientific and technological development a necessary condition for the survival of the empire.

Various peoples in Western and Central Africa welcomed the Europeans who came to trade at the end of the fifteenth century. Soon, the Europeans limited their commercial activities to the slave trade in order to feed the insatiable demand for labour in the Americas. Trade became exploitation through unequal exchange. In the course of the nineteenth century, the Europeans proclaimed their determination to abolish the slave trade and to replace it by trade in agricultural produce, notably palm produce and groundnuts, as well as cotton, ivory, timber and sisal hemp. Their objective was to facilitate the activities of Christian missionaries, who sought to evangelize, study the languages,

make the Bible available in those languages, and promote schools and training colleges. Not without some resistance, the people welcomed the new trading policies. They encouraged the work of the missionaries in the belief that through literacy and Western education, their children would acquire some of the technology that enabled Europeans to manufacture such large ships and powerful guns, watches, and other interesting objects. The influence of missionaries was spreading, but the most notable centres of missionary work were to be found in different parts of the coast of West Africa, Southern Africa, and Madagascar. It has been said that the proportion of children in Western-type schools in Freetown and Antananarivo in the third quarter of the nineteenth century was higher than in most parts of rural Europe. Thus, the foundation was already laid for Africa's thirst for Western education and technology in the search for development, even before the European conquest, partition and imposition of colonial rule. In many places, while the chiefs mobilized armies to resist conquest, many missionary-trained Western-educated Africans welcomed European rule in the hope that it would facilitate access to Western education and technology. This hope was often frustrated.

## THE COLONIAL FACTOR

Under colonialism, the key to cultural and scientific development was obviously the spread of Western education, which was seen as the most essential aspect of the 'native policy'. In most parts of Africa, the missionaries propagated Western education as a means to evangelization. Western education was thus closely linked with the spread of Christianity, with obvious implications for cultural identity. For Muslim communities in particular, it presented the problem of how to acquire Western education without losing their own cultural identity, including traditional religious education. The ambivalent attitudes of the colonial rulers to the spread of education illustrated the gap between the theory and the practice of colonial rule.

### The Ethiopians and the Italians

The rejuvenation and expansion of Ethiopia under Menelik II at the end of the nineteenth century provides a necessary background to the history of scientific and cultural development in Ethiopia and the Horn country in the twentieth century. It is typical of attempts at modernization from within by several states in Africa, such as the Sokoto, Massina and the Tukulor states of the jihad movements in West Africa, the Mahdist state in the Sudan, the Nguni states of Southern and Central Africa, and the Merina state in Madagascar. Some of these relied on a revival of the Islamic faith and culture, others on the transformation of traditional cultural leaders into military and executive rulers. All made overtures to European traders or missionaries for the acquisition of improved guns and new technologies, while resisting cultural alienation and territorial encroachment. Europeans took advantage of any openings to transform trading relationships into conquest and colonial rule. The struggle for development in Africa thus involved a constant struggle to borrow modern techniques from Europeans without losing cultural identity,

and while defending or trying to regain independent political and economic existence. The situation was often complicated by the ethnic and cultural diversity of the peoples grouped arbitrarily by the Europeans into the colonial states, with their internal struggles and diverse responses to colonial rule.

Scientific and cultural development was essential for the survival of the Ethiopian empire from internal divisions and the pressures of external powers, which came not only from Europe, but also from Egypt and the Sudan. In his conquests of southern Ethiopia, Menelik saw himself as reclaiming lands that were once part of the empire before the jihad of Ahmed Gran in the sixteenth century expanded the frontiers of Islam and precipitated the immigration of both Muslim and non-Muslim Oromo. The conquests were consolidated with fortified outposts manned by carefully selected governors who supervised the work of priests building churches and schools, spreading Amharic language and culture, putting pressure on the traditional rulers to embrace the Coptic Orthodox Church, and promoting urbanization. Having failed to win Massawa from the Egyptians, Menelik had to rely on diplomacy to maintain access to the outside world. He saw the British and the French as the major threats to his imperial authority. He therefore leaned more towards the Italians for external recognition and supply of arms and ammunition. For this reason, he yielded to Italian claims on the coast and in Eritrea. When the Italians tried to exploit this to change Ethiopia from an ally into a protectorate, he resisted and defeated the Italians at the Battle of Adwa. In spite of several international treaties, Menelik was not allowed to participate in the Berlin Conference of 1884–85. His territories, like the rest of Africa, were treated as 'no man's land' or *terra nullius* in international law. But Ethiopia survived as the only traditional African polity that escaped the imposition of colonial rule. For the rest of Africa, Ethiopia became the symbol, and Ethiopianism the slogan, of Christianity with an African identity, a non-Western religion, and a vehicle of African nationality in the modern world.[3]

The process of Italian pacification in Eritrea and Somaliland was by no means over by 1918. The Somali shared a common language and culture, but were divided into several clans and polities. Sporadic revolts continued until the end of the 1920s. In their resistance against the various colonial powers and Ethiopia, especially with the pan-Somali appeal of al-Sayyid Muhammed's jihad of 1897–1920, the Somali began to develop new consciousness of a common Somali nationality. This was further aided by the Osmanya alphabet, invented in 1920 by Uthman Yusuf Kenadid, which began to spread in spite of the hostility of the Italians and conservative clerics who preferred the Arabic script. Nevertheless, the Italians were determined to exploit the resources of the territories, at minimal costs to themselves. They established a framework of administration and made grants of sizable agricultural lands to concessionaries, which selected chiefs to collect taxes and recruit labour to work on the plantations, either by coercion or the manipulation of taxation. By 1930, as Italian control became consolidated, and with the rise of Fascism, colonial exploitation became a national programme. Concessionaries were phased out, elaborate plans were made for large-scale immigration of Italian settlers, and substantial investments were made on

infrastructure in roads, irrigation, and research in field stations and metropolitan institutes. Colonial rule became more authoritarian, and systematic racism was decreed, including the prohibition of interracial marriages, and the dissolution of those that predated the decree – a foretaste of the elaborate South African system of apartheid.

Under Fascism, the desire to invade and conquer Ethiopia to avenge the defeat at the Battle of Adwa in 1896 became a prime objective of the Italian state. After making elaborate plans, Italian forces suddenly invaded Ethiopia from the north early in October 1935. They moved very quickly and occupied Adwa by 6 October. The League of Nations condemned the action and imposed limited sanctions on Italy. They did not want to provoke Italy and did not care enough about Ethiopian independence to impose such sanctions – for example, a blockade of oil supply – that could deter it. Thus betrayed, Ethiopia fought alone. Their resistance gathered strength and remained unshaken until Italy resorted to the use of poison gas, which enabled them to occupy Addis Ababa by 6 May 1936. The policy already established in Eritrea, of expropriation of land for the benefit of large-scale immigration of Italian settlers, was extended to Ethiopia along with apartheid.

Italy was determined to systematically weaken, if not eliminate, the rising Ethiopian educated elite, particularly those trained abroad in science and technology. The Italians were determined to develop Ethiopia with the skills of Italians and the labour of impoverished Ethiopians, for the benefit of Italians. They invested capital, built a network of roads and field research stations. The Fascist assault on the most ancient and venerated polity in Africa south of Egypt galvanized nationalist opinion, not only in Ethiopia and the Horn country, but also throughout Africa. It stimulated the pan-African movement in the Diaspora, and brought the morality of the whole colonial enterprise into question. The British army occupied Ethiopia in 1941 and restored Emperor Haile Selassie to his throne. Colonialism was shaken, but it was far from being defeated in Africa, even in Ethiopia.

**Great Britain**

British Africa started from crown colonies like Freetown, Barthust and Lagos, with institutions based on metropolitan models. A high literacy rate resulted from the close collaboration with missionaries, especially for the care of freed slaves. Beyond these, the vast areas acquired during the 'scramble' for Africa were protectorates. Large parts of these were placed under the control of concessionaries or chartered companies. When these were phased out, they were replaced with the system called Indirect Rule, in which colonial officers, wherever possible, delegated some local responsibilities to reconstituted 'native authorities'. The aim was to keep down expense and govern with the minimum of staff.

Generally, the British saw the need for a limited number of people with some Western education who could be subalterns of the colonial work force as messengers, interpreters, clerks, medical and veterinary assistants, etc. The British were willing to leave the basic training of such people to various Christian missionary bodies, whose efforts were supplemented, for example in Muslim areas suspicious of Christian education, by a few government schools devoted to children and the protégés of traditional rulers. From the 1880s onwards, the government gradually built up a system

of monitoring the performance of such schools through inspection. The granting or withholding of approval and grants-in-aid were used to enforce compliance with government guidelines and regulations.

Eventually, in 1923, an Advisory Committee was set up in the Colonial Office to coordinate the formulation of policy and supervise its implementation throughout Anglophone Africa. The need for such a committee was confirmed in the 1922 report of the US-based Phelps-Stokes Commission, which visited West, Central and South Africa to propagate the Tuskegee Institute's philosophy of 'appropriate policies for the education of blacks'. The Committee endorsed the policies recommended by the Commission and sponsored a second visit and Report of the Commission on South, Central and East Africa. The members of the Advisory Committee, who were influential and powerful and possessed extensive expertise, exerted decisive influence on policy, which

*Map 16* **British colonies in Africa**
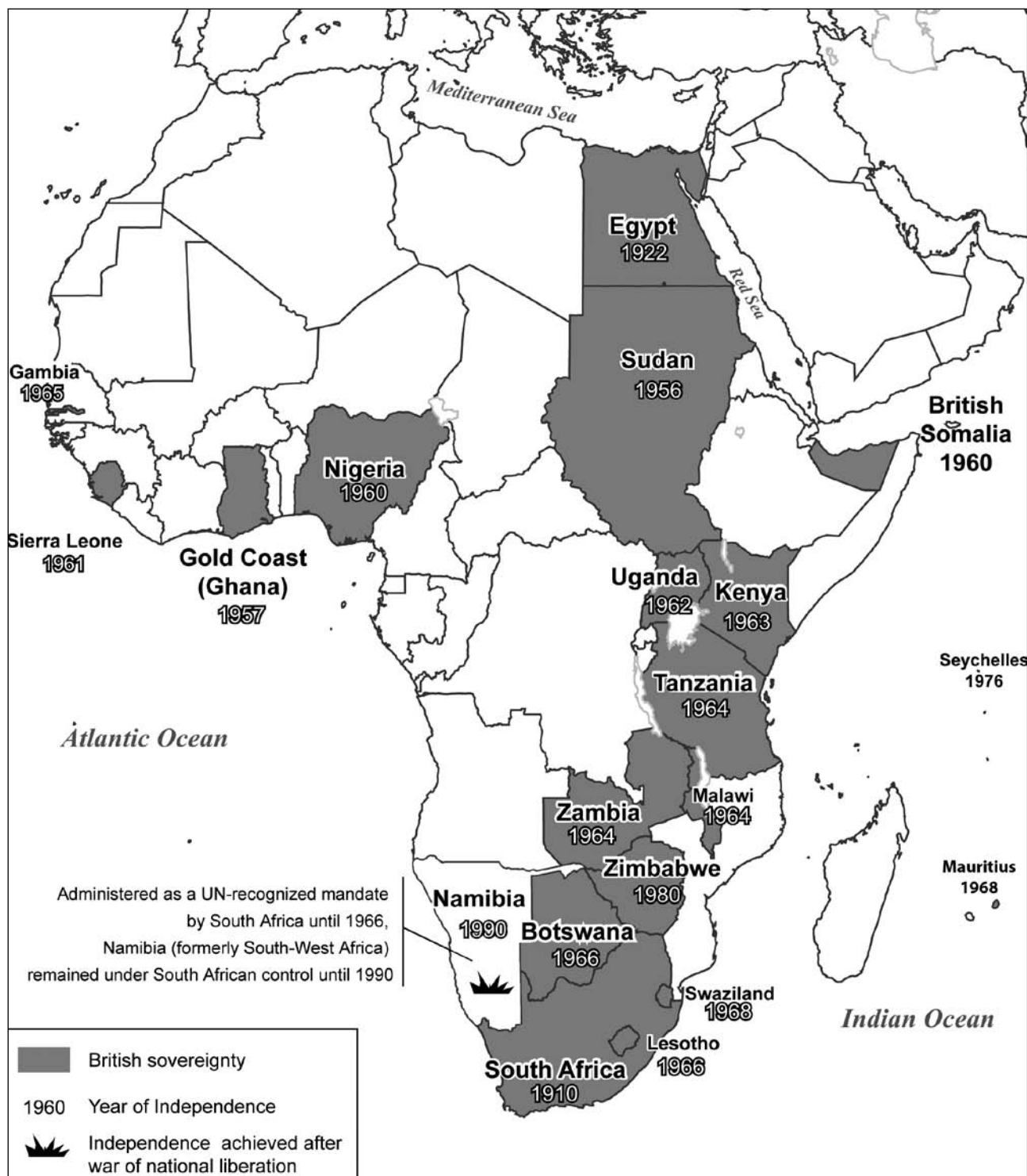
reflected the ambivalent attitudes of the colonial office. Some members wished to stimulate the demand for Western education as an agent of social change that would in turn promote development. Others preferred to use educational policies to preserve traditional life and values so as to slow down the pace (and control the direction) of change. The first major statement of the Committee reflected this ambiguity:

> Education should be adapted to the mentality, aptitudes, occupations and traditions of the various peoples, conserving as far as possible all sound and healthy elements in the fabric of their social life; adapting them where necessary to changed circumstances and progressive ideas as an agent of natural growth and evolution[4].

The more progressive members wanted education to adapt traditional values to 'changed circumstances and progressive ideas', but they had to compromise and accept 'natural growth and evolution' rather than change as such as the objective of education. The conservatives had the upper hand and colonial policies emanating from the Advisory Committee remained very restrictive until after the Second World War. Such policies were less effective in West and South Africa than in Central and East Africa. In West and South Africa, missionary bodies had encouraged the establishment of secondary schools from 1840 to 1880. A momentum was created among the former students of such schools and later restrictive colonial policies could not entirely stifle this forward movement. On the other hand, European settlers in Central, East, and eventually in South Africa, and the mandated territory of South-West Africa, exercised such influence on the local colonial administrations as to turn the restrictive policies of the Advisory Committee virtually into obstructive walls. The usual pattern in West Africa was for the missionaries to establish a trade school and for community pressure to convert the trade school into a grammar school emphasizing the classics and religious education. Usually, there was no science taught beyond hygiene and practical agriculture. In Nigeria, with 30 state-assisted grammar schools, it was only in 1929 that the government established the first two government colleges to include science in the curriculum. Training of carpenters, masons, mechanics, tailors, drivers, etc., was usually by apprenticeships in small private establishments. The grammar schools thus concentrated on purely literary pursuits, despite the repeated advocacy of the importance of technical and technological education. In Central and East Africa, secondary education was either non-existent or remained at the level of trade schools. Makerere, established in 1921, remained a trade school offering a wide variety of courses – carpentry, mechanics, para-medical, veterinary, surveying, agriculture, clerical, even teacher training – until 1933 when it became a full secondary school. In Zambia (Northern Rhodesia), the first junior secondary school was established in 1939. Kenneth Kaunda was forced to observe in 1966 that, as far as educational policy in Zambia was concerned, Britain preferred 'financial exploitation to human development'[5].

The impact of colonial educational policies on cultural and scientific education in Anglophone Africa was a complex issue. The missionaries had made significant progress in promoting literacy in several African languages. Several of these languages were used in evangelization and in the schools. This helped to stimulate cultural awareness at the elementary school stage. But the overall impact of colonialism was to focus attention on the culture of the colonial power. The literary grammar school, promoting European culture and alienating the fledgling educated elite from their traditional culture, dominated the perception of parents and even the ambitions of elementary school children. In such circumstances, there was more of cultural imitation than cultural development. In spite of occasional bouts of cultural revival denouncing wholesale imitation of European culture, European names, dress, food, literature, art and sports continued to be preferred to African ones as being more appropriate for educated and civilized persons. This imitation of European culture was featured at Empire Day celebrations, school concerts and other festive occasions. Only classical European music failed to win many African converts, perhaps because the missionaries, most of whom were not high-browed, promoted hymnology rather than classical music as such.

## France

Before the end of the First World War, no clear-cut policy on colonial education emerged in France because there was no consensus on 'native policy'. The government clearly distanced itself from the mid-nineteenth century liberalism that conferred citizenship rights on the Four Communes in Senegal. Those rights were not abrogated, but there was no question of extending them to other communities. Instead of adopting the policy of assimilation, official policy began to favour 'association' of the masses through the prevalence of French language and culture. Much effort was devoted to studying Islam so as to encourage Muslims to retain their faith while embracing the French language and aspects of French culture, provided they steered clear of international Islam and radical Middle East politics. Individual ministers and colonial administrators took the initiative, generally within the context of the prevalent anti-clericalism that bred a distrust of missionary activities and the tendency to centralization that encouraged officials to seek directives from Paris.

By 1918, there was wider appreciation of the tremendous contribution of African manpower and material resources towards the French effort during the war, and of the potential role of the colonies in revitalizing the French economy. This was the message of the book entitled *La mise en valeur des colonies françaises* by Albert Sarraut, the Minister for the Colonies. Sarraut's aim was to seek 'the economic growth and human development' of the colonies, in the spirit of the new 'trusteeship' of the strong protecting the weak. Education remained the most vital instrument not only of human development, but also of economic growth. Various directives were published in successive issues of the Education Bulletins to spell out the objectives of French colonial education:

    – to expand the influence of the French language in order to establish [French] nationality or culture in Africa;
    – imperial duty and political necessity impose … [the need for] training an indigenous staff destined to become our assistants throughout the domains and to ensure the emergence of a carefully chosen elite … and of educating the masses to bring them nearer to us and to change their way of life.

In practice, French administrations did little to educate the masses. The role of French language and culture in breeding respect, support and loyalty to the French, as a way of enhancing the productivity of the masses, continued to be stressed. But, promoting French language and culture was left to the indirect effects of the French presence and the activities of missionaries in the rural areas. Far more emphasis was placed on the members of the carefully chosen elite, who were to become not only assistants, but also great admirers of French culture and loyal defenders of French colonial rule. They were to be detached from the masses, to function principally in the urban areas, preferably in Dakar,

where the vestiges of the old policy of assimilation remained, or, best of all, in Paris. Policy guidelines were to ensure that although missionaries were welcome, the educational system was to be as formulated and dominated by the state. Missionary work was encouraged largely in rural elementary schools of two to three years, teaching mostly spoken French and some arts or crafts. It was the responsibility of the state to ensure urban and regional upper elementary schools, and at least one higher primary/technical school in each colony. Such schools sent their best students to the state central secondary schools (Lycée Faidherbe in St. Louis, or Lycée van Vollenhoven in Dakar), or the

*Map 17* **French colonies in Africa**
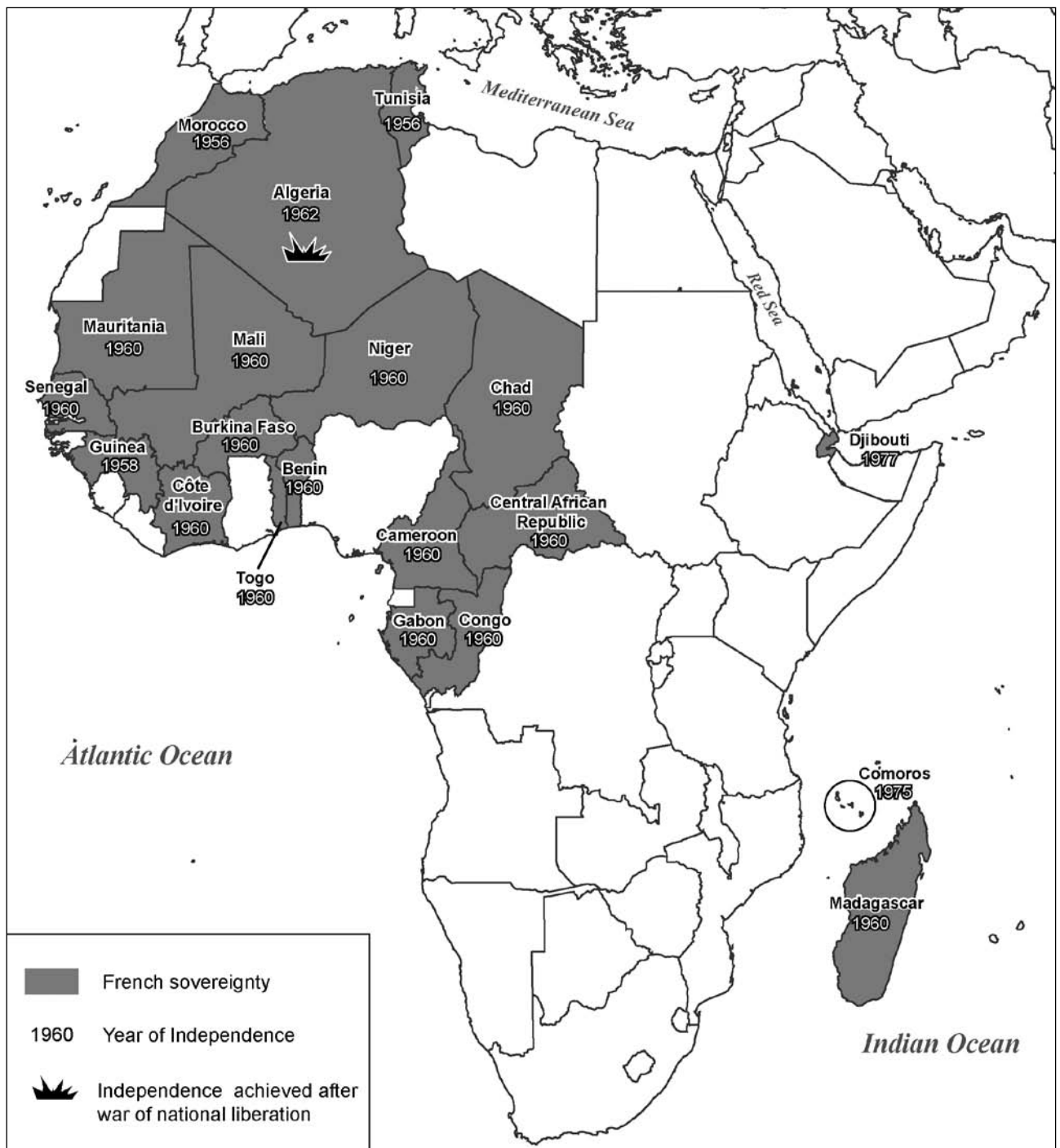
comprehensive Teacher Training College (William Ponty). In the early decades of the century, there was some attempt at the William Ponty to encourage appreciation of the local culture.[6] There were also the Dakar School of Medicine and Pharmacy, the School of Naval Engineering in Gorée or the Veterinary School in Bamako for training assistants.

The initiative to stimulate research in colonial territories came from a few outstanding scholars who wished to extend the research interests of different French institutions to the colonies. Following in the footsteps of Louis Archinard and Captain Louis Desplagnes, scholars, such as Maurice Delafosse, Marcel Griaule, Theodore Monod, Jean Cremer and others, tried to extend the work of various Paris-based institutions to the colonial territories. These included the Museum of Natural History, the Trocadéro Museum of Ethnography, the Pasteur Institute, the School of Oriental Languages and the Geographic Society. This encouraged the establishment of local research infrastructures in Africa. As early as 1902, Gallieni was working to set up the Academy of Madagascar. In 1915, Governor Clozel founded the Comité des Études Historiques et Scientifiques (Historical and Scientific Studies Committee) for the AOF; while the AEF established the Société des Recherches Congolaises (Congolese Research Society). Each institution developed its own journal or research bulletin: the Madagascar *Notes, reconnaissances et explorations*; the AOF *Bulletin du Comité des Etudes historiques et scientifiques*; and the AEF's *Le Bulletin de la Société des recherches congolaises*.

The specific areas of focus in the growing colonial scientific infrastructure included ethnology, archaeology, health, agriculture, meteorology, and geology. The aim of the institutions at the time was to gather information and not to build up or train local scientists. The professional staff of the institutes, laboratories, observatories and networks of meteorological and geological services were almost exclusively French. Any promising African assistant was more likely to be assisted to get to France than to be encouraged to remain in his homeland. By the early 1920s, various experimental botanical gardens were established, for example, in Dabou and Bingerville in Cote d'Ivoire; Saria and Niangoloko in what is now Burkina Faso; Kati in Mali; and Brazzaville in Congo. Some of them began to specialize, like the one in Bambey (Senegal), which became famous for its work on groundnuts. It has been pointed out that often the researchers were not highly specialized. For example, the agricultural experimental stations were often manned not by virologists, but by plant taxonomists and general pathologists. Nevertheless, important breakthroughs were sometimes achieved. The precipitous fall in world market prices of groundnuts and other colonial commodities during the Great Depression halted such developments. Groundnut prices improved after 1934, and the Front Populaire initiated the era of planned development from 1936 to 1940. They expanded education, founded IFAN (Institut Français d'Afrique Noire/ French Institute of Black Africa) at Dakar, and gave research a fresh impetus. But all that was undermined by the racist policies of the Vichy Government, which abolished the citizenship rights of the Four Communes, the freedom of the press, freedom of public assembly, the right to demonstrate, and many of the social reforms of the Front Populaire.

## Portugal

The long history of the Portuguese presence on the coast of Guinea, and in Angola and Mozambique produced significant communities of mestiços or Portuguese settlers, traders and officials and Africans of black or mixed ancestry. They were based primarily in the coastal cities, the largest community having settled the Cape Verde islands. The 1950 census listed 103,000 mestiços in Cape Verde, 4,500 in Guinea, 4,300 in São Tomé, 30,000 in Angola and 25,000 in Mozambique. Preserving links from the era of the slave trade and caravans, mestiços remained influential along the trade routes and had contacts with the centralized kingdoms in the interior. Portugal retained possession of vast territories without the means to establish effective occupation, not to mention the pursuit of economic, cultural and technological development. The government therefore resorted to granting concessions to various individuals and private chartered companies. Since the pre-colonial period, land grants or prazos were available for those wishing to establish plantations or exploit mineral resources. Concessions for building railways or other specific economic activities were also granted. These companies acquired extensive rights and a large degree of autonomy: they were allowed to collect taxes, mint and issue money and define development policies for the territories. All of the concessions depended on the exploitation of African labour. The system was based on the belief that Africans owed 'a moral and legal obligation to work', which meant working under the orders and in the interest of the controlling power. Access to cheap labour was the main attraction of concession seekers, who often possessed little or no capital to invest. Because Mozambique blocked access to the sea for several British territories – Malawi, North and South Rhodesia, Transvaal, Bechuanaland, Basutoland and Swaziland – a large proportion of the concession seekers were anxious to control that colony.

With several companies, agencies and individuals of different nationalities exercising power and control, Portugal was in no position to formulate and implement a well-defined native policy. In theory, Portugal maintained a non-racist policy, and the mestiços and *civilizados* were entitled to all the rights of citizens. Although they were not subject to African taxation or forced labour, they were expected to pay European taxes, which were more burdensome and more difficult to evade. They had to renounce 'African customs', give up entitlement to African communal land rights, and the possibility of becoming chiefs. Few acquired the necessary educational qualification, and many of those who did were discouraged by the procedural delays and administrative obstacles. For the vast majority of 'natives', there were guidelines for the operation of labour laws, which were eventually codified in 1929 as the Estatuto Politico Civil e Criminal dos Indigenas.

Education was in the hands of missionaries, few of whom were Portuguese: they included English Baptists, American Congregationalists and French Holy Ghost Fathers. After the overthrow of the monarchy in 1910, the Republican regime was overtly anti-clerical, and the Portuguese Jesuits in Mozambique were expelled in 1911. Other missionary societies, especially in Angola, had deeper roots going back to the nineteenth-century evangelical and abolitionist movements. They provided a few years of elementary

*Map 18* **Portuguese colonies in Africa**
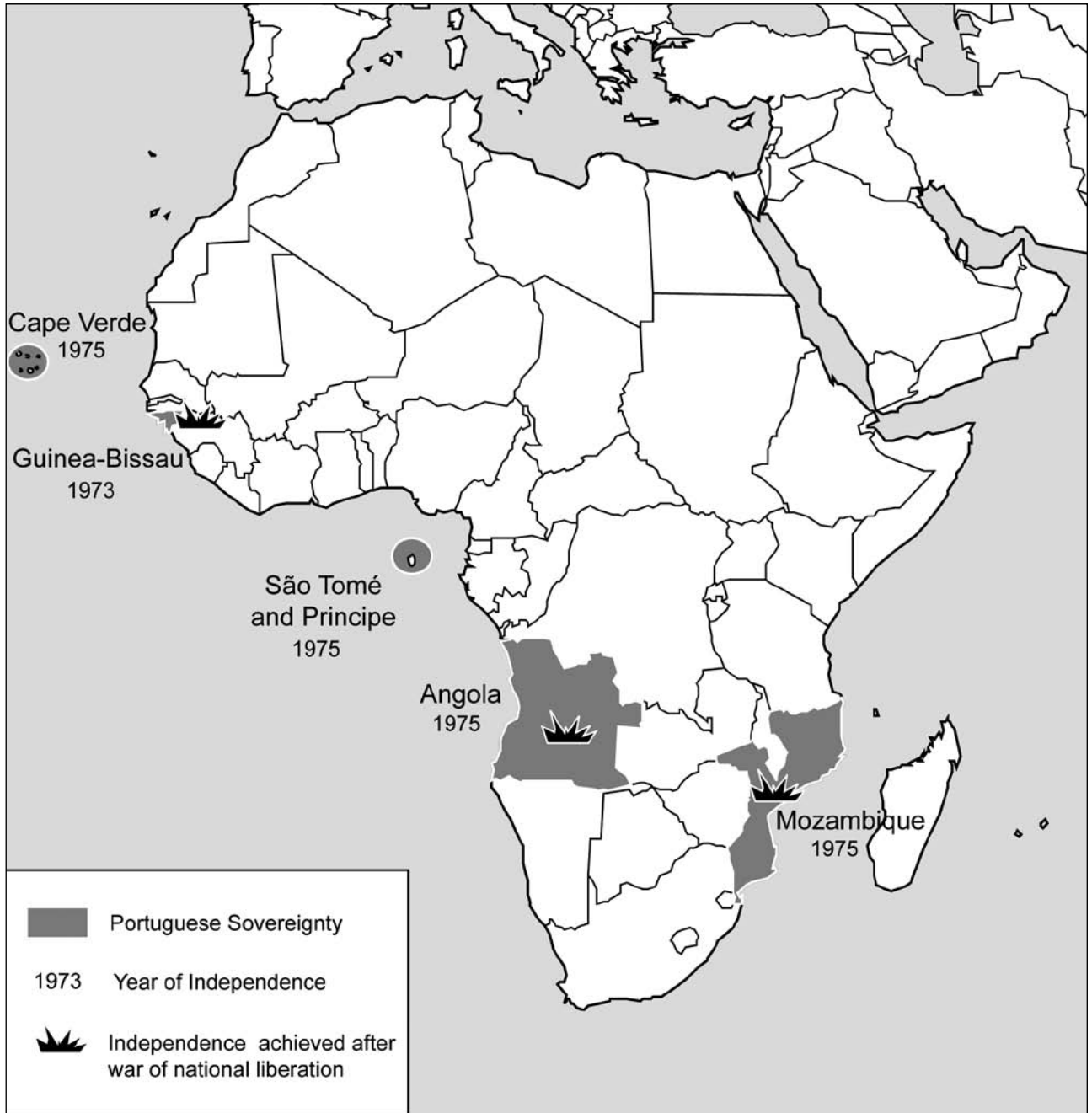


education in the rural areas, some secondary education, mostly technical or arts and crafts, and the training of village teachers and catechism instructors. Missionaries, particularly the Protestants, were often harassed for being critical of government or for siding with African victims of scandalous abuse, poor administration and repression. A law passed in 1921 made it compulsory for all missionaries to be ordained ministers, all churches to teach in Portuguese, and the Catholic clergy and religious orders to be subject to Portuguese episcopal authority. Some of the concessionaries operated schools to teach reading and crafts. For purposes of acculturation, the churches were as influential as the schools, which enforced monogamy, civil laws, use of pit latrines and other facets of Portuguese social life. Cultural

and technological education was almost negligible until after the Second World War. In 1929, Mozambique registered only 30,600 pupils, mostly in rural schools, and in Angola the total did not exceed 46,000.

The Republican regime in Portugal (1910–26) increasingly encouraged the lower classes to seek employment in the colonies. This led to further discrimination against the mestiços, whose influence declined accordingly. Following an agreement with the Salazar regime in 1940, the Catholic Church received the mandate and the funding to educate the indigenous populations, inculcating European values and indirectly supporting Portuguese colonization. This led to a rapid increase in the number of pupils in schools in Mozambique.

But such measures were enacted largely for the benefit of the rising number of Portuguese settlers, who were encouraged to immigrate to the colonies in accordance with the policies of the regime. This policy in turn further increased the discrimination against Africans and the mestiços. During the Depression, thousands of Cape Verdian migrant workers were repatriated from the United States to work towards the 'development' of the colonies. In 1940, Angola recorded 44,000 Portuguese settlers, Mozambique 27,000. By 1950, the figures rose to 79,000 and 48,000 respectively. By 1960: 172,500 and 97,000; 1970: 290,000 and 150,000; by 1973: 335,000 and 200,000. For the most part, these new settlers were poor whites with no capital and few skills. They were meant to become self-reliant producers, but they quickly joined in exploiting and oppressing the Africans on the basis of an undeclared policy of apartheid. The *liceus* and rudiments of higher education that began to be established were essentially for their benefit.

## Belgium

The determination of King Leopold to reap the maximum profit from the Congo Independent State, which was assigned to him as a private estate, led to systematic abuse and international outrage. He leased the area to concessionaries. He declared a state monopoly on ivory and wild rubber. Among other abuses, Africans sometimes had their hands cut off by certain employees of commercial companies, who also burned the villages if inhabitants failed to pay taxes and produce rubber latex. At first, the outcry of Swedish, American and British missionaries was ignored. Then, E. D. Morel, a young British journalist, published a book about the 'new slave trade'. He formed the Congo Reform Association and took up the crusade in the British parliament. No longer able to ignore the international pressure, the Belgian government seized control and changed the name of the Independent State to Belgian Congo. The Belgian state was determined to carry out reforms and keep a tight control over the administration. The native policy that resulted has been aptly described as paternalism. It was a form of trusteeship that justified treating Africans as infants that needed to be guided and controlled, even to the point of enforced conversion. After 1918, the same system was extended to Ruanda-Urundi, though the substructure of German rule and the links with Tanganyika and Uganda remained close.

The Congo basin had been an attractive mission field for the evangelical and abolitionist movements of the nineteenth century, not least because of the history of evangelization and the slave trade in the area since the sixteenth century. The area attracted British and American Baptists and British Congregationalists as well as French, Italian and German Catholic orders. The Belgian state made a pact with Rome to support and subsidize the work of Catholics provided the personnel were restricted to Belgians. Only those Protestant missionaries who were licensed and operated strictly within state regulations were tolerated. The missionaries operated two-year primary schools, taught in African languages; three-year middle schools with French instruction; and a sprinkling of technical schools for training assistants in administration, health, teaching and mechanical labour. It was only in strictly controlled Catholic seminaries that future priests were allowed a higher level of education.

The tight control exerted by the authoritarian state did little for cultural and technological development. Schools operating within the triangle of such authoritarian administration, big mining and agricultural farms, and the privileged Catholic mission did little more than teach discipline and obedience. The Catholic priest used the privileged position of the Church to compel children to go to school, to encourage converts to attend catechumen classes, and to make everyone conform to moral law as laid down by the mission. The foundation was being laid for a sound system of elementary education, which was reformed after the Second World War. Meanwhile, it is not surprising that the close alliance of church and state was threatened by the Kimbanguist movement. In 1921, a barely literate evangelist of Baptist background, who responded to a persistent vision of a divine call, became a spirit-possessed prophet. He preached orthodox Baptist doctrine, but also operated as a healer, drawing huge crowds from far and near. Some of his followers were reported to have incited Africans to refuse to pay taxes and to use anti-colonial rhetoric, such as 'Congo for the Congolese'. Above all, they advocated widespread disobedience of Belgian orders, such as working for white men, sending children to school, etc. Some of them attacked a Catholic chapel that they viewed as part of the system that oppressed them. Catholic missionaries supported the plantation owners, who were losing control over their labour force, in their appeal for the suppression of the movement. Kimbangu and some of his followers were arrested. He was tried and condemned to death with no legitimate charge brought against him. This was later commuted to life imprisonment. He died in prison in 1951. In spite of this, and perhaps also because of it, the Kimbanguist Church spread rapidly and became the largest African Church in the Congo basin. Like Ethiopian religious institutions in other places, it did more than any other church in the region to mediate between Christianity and the beliefs of African peoples. It was thus a major factor of change, with profound cultural consequences.

## TECHNOLOGICAL INNOVATIONS

Colonial rule brought scientific and technological innovations in many areas of life, notably agriculture, health services, transport and communications, energy, mining and metallurgy. As a rule, these innovations were imported and not developed locally. Like European culture, such innovations were desired but had little chance of being integrated into the life of the people. As long as science was coming through Western education and culture, which remained divorced from the life of the people, there could be no growth. There was thus no effective transfer of technology except to the enclaves of British, French, Portuguese and Italian settlers in Eritrea, South, Central and East Africa. Nor was there any attempt to develop industries based on these innovations. Rather, colonial policies were meant to ensure that imported technology undermined or displaced existing crafts and industries. To some extent, assistants were trained in the trade schools or special workshops to maintain the various services, but not to improve production and quality.

## Urbanization

The effects of colonialism were felt more in the urban than in the rural areas, and the towns became the showcases of the colonial impact on cultural and scientific development in Africa. Urbanization was an important feature of many pre-colonial African societies. A few, like the Ethiopian and the Yoruba, possessed an urban culture. Most Africans preferred to live in towns and nucleated villages comprising the ruler's palace, religious centres and markets, and to travel to the rural areas to carry out farming activities. In most societies, the capitals were urbanized, especially the capitals of kingdoms and empires, such as Benin, San Salvador, and Kumasi. Such administrative centres also attracted long distance traders and resident foreigners. Other towns, such as Timbuktu, Jenne and Kano, or Massawa, Lourenço Marques and Mombasa, because of their location at the end of trade routes, river crossings, or on the coast, became market centres, which attracted crafts, manufacturing and large numbers of resident foreigners. Islam had a particular impact on many urban areas, making the populations more open to foreigners because of the long distance traders, scholars and religious leaders that they attracted. In the nineteenth century, many of the capitals in Muslim Africa had numerous administrators, judges, military and religious leaders, and itinerant scholars and students at public expense. They thus also attracted large numbers of slaves from far and near to act as soldiers and to produce surplus food and trade in the surrounding rural areas.

Colonial rule had an even more spectacular impact on urban life. It began with trading outposts, military garrisons and forts, and administrative centres established on the outskirts of existing towns or at new locations. The infrastructure of colonial rule, such as courts, treasuries, police and military barracks, were the essential features of such towns. However, the more important role of colonial cities was to serve as centres for the import and export trade, that is ports, often doubling as capital cities, railway termini, or other collecting points for cash crops. As such, banks, shops, warehouses for imported goods, and for processing cash crops for export, developed. Such centres also were often the headquarters for missionary societies, with churches, schools and training colleges of local and regional importance. People flocked to these centres as urban workers migrating from the rural areas. Because of racial discrimination, the small group of European settlers, traders, missionaries, administrators and other professional staff and their families occupied the centre of the colonial town, with specially designated suburbs for Africans, each with its separate markets, shops, churches, hospitals, and even cemeteries. Often, Africans – even the domestic staff of European households – were not allowed to stay in the 'European' towns beyond sunset. It is noteworthy that the colonial cities, unlike traditional towns, were not allowed to promote and sell African crafts and manufactured products.

Such colonial towns were important centres for the diffusion of the European urban culture and greatly expanded the cultural influence of missionaries that began to spread in the nineteenth century. The European settlements were planned according to the town-planning traditions of the different European countries – the British, with their roundabouts; the French, with cultural centres and museums, etc. Architecture also varied according to the different national styles. Although Spain and Portugal had experimented with some tropical architecture in Latin America, and the British in South India, the influence of metropolitan temperate climate architecture was initially predominant. For example, fireplaces were often incorporated in up-scale homes even though they were never used. Africans with the necessary means built in the European style, abandoning their own styles of age-old traditional architecture, which was better adapted to the climate. European building materials, particularly cement and corrugated iron roofs, were widely adopted. Bread became a staple, bakeries proliferated, and European cuisine – Irish potato and oven-cooked instead of stewed meat – was sometimes imitated. European drinks began to supplement traditional African beverages. European-style bars and nightclubs emerged, but the popular music that was influential was not European but Latin American, which was itself an urbanized version of music originally exported from Africa.

Municipal services emerged: water and electrical energy supplies, refuse disposal, etc. Initially constructed for the benefit of European officials and settlers, especially in the mining and industrial areas, electricity supply was expanded to privileged Africans in the urban areas, such as Luabo, on the Sena Sugar estates concessionary in Mozambique. In 1924, an observer reported that the company 'did not limit itself to constructing a factory; it is constructing a city' with electric generators, railway, hospital, refrigeration plant, bakery, telephone service and workshops, all built by the company.[7] Initially, the electrical engineers in charge of the planning, distribution and maintenance of electricity supplies were expatriates. Workshops were established for the training of African assistants to help maintain the high-tension wires and the generators. It was not until after the Second World War that African electrical engineers trained in universities abroad were employed.

## Agriculture

The colonial powers introduced two systems of agriculture. Without any experience in tropical agriculture, they occupied the best land in the temperate zones to develop European-type farms. They expropriated land from the Africans thus making land and the labour of landless Africans available to Europeans at very low cost. They also facilitated access to capital through the banks, using land as collateral. The farms were protected by various laws to prohibit African peasants from producing not only such export crops as tea and coffee, but also dairy products that had been the specialty of different pastoral communities.

In the tropical areas, African peasants were encouraged (and sometimes compelled by taxation) to produce crops for export. The colonial authorities took no interest in the cultivation of food crops. The methods of production of cash crops that they dictated were based upon the farming techniques of temperate climates – intensive cultivation, crop rotation, mono-culture – which disregarded, or even discouraged, the considerable accumulated knowledge and techniques more suitable to the soils and climatic conditions of tropical agriculture. These included:
- production techniques of crop rotation and inter-cropping systems for pest control;

– great capabilities in the areas of post-harvest technologies of food processing, preservation and storage, including the fermentation of sugar to produce alcohol, and the coagulation of milk protein into butter and varieties of cheese;

– considerable experience in animal husbandry and the control and treatment of animal diseases;

– expertise in hunting and fishing involving extensive knowledge of the varieties, habits, and preferred habitats of both animals and fishes.

One serious effect of colonial agriculture was the severe depletion of soil fertility and imbalances in the eco-system, which led to the disastrous spread of trypanosomiasis. More disastrous, however was the undermining of traditional scientific knowledge and skills that could have been used to contain the adverse effects. Probably the most striking example of the devastating effect of Western agricultural science, no doubt combined with other factors, is to be found in Ethiopia, where the practice of agriculture has been documented for two thousand years. There are also the accounts of several foreign travellers who, for four centuries, described the Ethiopian plateau as 'verdant' and 'salubrious'. 'It seems that in all the world there is not so populous a country, and so abundant in corn and herds of innumerable cattle', said the Portuguese Jesuit Father Francisco Alvares in 1520. The northern Ethiopian highlands, said Henry Salt in 1816, were 'so rich in water and pasturage that Europeans could scarcely imagine its beauty'.

Menelik embraced Western agricultural science in 1907 when he appointed a Minister of Agriculture 'to improve the land, produce much grain and change agricultural work … in the European method'. This was partly his response to the Agricultural Research Institute established by the Italians in Asmara (Eritrea) in 1893. In 1938, the Agricultural Institute for Italian Africa established in Florence, with its fine Library and Documentation Centre, was assigned the task of overseeing Ethiopian agriculture. Yet, the productivity of Ethiopian agriculture declined steadily. The US Technical Assistance Program, which brought in the Agricultural and Mechanical Arts College of Oklahoma (later Oklahoma State University) to apply the American land grant system, seemed to have accelerated the pace of decline. Successive famines, which caught the attention of the media in the 1970s, showed the gravity of the situation. An observer remarked in 1985:

A culture is dying in Ethiopia. A complete way of life, virtually unassailed for 3,000 years, is coming to an end. The Abyssinian high plateau, known to the Greeks as a 'cool celestial island' is rapidly turning to dust, merging wearily into the barren and stony deserts that surround it. As it does so, the human population that it has supported for so long are blowing away too. Having slaughtered their draught oxen and eaten their grain, the people are leaving for ever their eroded fields and terraces.[8]

The agriculture training provided in the schools was ineffective because it was unrelated to local farming practices and was being taught to people who regarded the very system of formal education as an escape route from the rural life of farmers to the urban environment. A number of specialized schools and experimental stations were established to train agricultural assistants and extension workers to implement government agricultural policies.

Their attention was entirely focused on export crops rather than food crops. Eventually, an Institute of Tropical Agriculture was established in Trinidad, in the West Indies. It was not until the era of decolonization that some of those trained in this institute began to raise the standard and expertise of the agricultural schools and to cooperate with the newly established universities to develop agricultural science locally. Meanwhile, indigenous methods of food processing and food preservation were ignored. Canned tomatoes, fruits, sardines and corned beef were imported without any attempt to produce them locally. In East and Central Africa, the corn meal that became the staple of the African diet was processed by European-controlled industries, and the Africans had to pay high prices for it. Similarly, the traditional machete and hoe remained the basic agricultural implements in many parts of the tropical areas, but imported tools soon replaced the ones produced by local blacksmiths. This is not to deny that colonial agricultural research has yielded some results of permanent value. Research in Africa has contributed to a more complete understanding of the complexity and diversity of natural phenomena at the global level, for example in plant science and plant physiology. Work on mycology developed across the continent yielded major collections of local mycolological materials. Many phythopathological problems of major crops, such as rubber and tobacco, have been resolved. Research on different flora of various regions of Africa has contributed much to the literature on world biodiversity. Such data on ecological diversity will be a major factor in improving African farming systems and productivity through technological innovations.

**Health care**

As in the field of agriculture, the missionaries and colonial powers created a parallel and superimposed system of health services instead of expanding the existing indigenous system. Largely because traditional healing systems were associated with various religious rites, it was assumed that, for the most part, African doctors were bogus and fraudulent. As in other areas, the loss of confidence in the power of traditional gods has resulted in a diminished interest in traditional culture, which was held together by the pervasive traditional religion and world view. Colonial authorities showed more interest in studying and controlling tropical diseases than in solving the problems of tropical agriculture. In French Africa, the network of the Pasteur Institutes, based on the principle of research as conducted in France, was of paramount importance. The first microbiology laboratory was set up in Saint-Louis (Senegal) in 1896. It was transferred to Dakar in 1913 and became part of the network of Pasteur Institutes in 1924. In 1910, a Pasteur Institute specializing in the study of sleeping sickness was established in Brazzaville. In 1934, a leprosy research Institute was founded in Bamako. In 1940, the yellow fever vaccine was developed at the Dakar Pasteur Institute, and the plague vaccine was developed at the Pasteur Institute in Madagascar in 1945. The Schools of Hygiene and Tropical Medicine in London and in Liverpool laid the groundwork of tropical health sciences in British Africa. The missionaries founded a few notable hospitals and clinics, while colonial governments established some European infirmaries and hospitals and a few African hospitals. These hospitals trained nurses and midwives and

other para-medical staff such as 'dispensers' (assistant pharmacists), laboratory technicians, etc. In West and South Africa, even by the 1880s, a few Africans had trained abroad as medical doctors, but no matter how well they performed at school, at best they were appointed as assistants to European doctors. One or two of these, like Dr. Oguntolu Sapara in Lagos, took some interest in traditional healing systems, but their work remained atypical.

European medicine made an impact especially in the control of contagious diseases such as smallpox, tuberculosis and, to some extent, leprosy. Inoculation and immunization programmes and other campaigns of preventive health care, especially in the urban areas, were widely appreciated. So were the practice of surgery and sterilization, the use of antibiotics, and the control of bacteria. Nevertheless, for reasons of accessibility and cost, European medicine catered only for a minority of the people. The two health systems remained separated because the Africans trained in European medicine have often been the most distrustful of traditional healing, and the most opposed to finding an accommodation between the two. Today, attempts are being made to identify the areas of strength of traditional healing and take advantage of them within an integrated healing programme. Such areas include:

– the concept of health and healing as involving not just the physical, but also the mental, the spiritual, and the patients' social relationships;
– psychiatry, which has been particularly enhanced by the holistic approach to healing;
– herbal cure of minor fevers, stomach disorders, etc.;
– bone-setting and orthopaedic surgery.[9]

### Transport and communication

Without doubt, the colonial period was very innovative in the development of technology in the field of transport and communication. First, there was the steamer, followed by the railways; and then the bicycle, lorries and automobiles. The technology and industry for the production of steam vessels remained abroad, but a few schools were established to train navigators and other shipping auxiliaries. Assistants were also trained to serve in the development and maintenance of the port facilities. Railways played a prominent role in the development of the import-export orientated colonial economies. Various companies won contracts or concessions to raise the necessary funds and construct the railways as cheaply as possible. Africans had to be involved in laying and maintaining the tracks, driving and maintaining the engines and coaches and operating the services. For these, workshops and training schools were established. The railways were meant to serve the economic and strategic interests of the colonial powers more than those of the Africans, and they helped the colonial power to resolve the problems of relatively low population density and dispersal of resources. As has been pointed out, they operated mostly for the export of cash crops and minerals. They ignored the internal road network. The telegraphs that were linked with the railways served the military forces and the needs of internal security and, although it was extended to commercial organizations, it was strictly for expatriate companies only. Radio broadcasting through rediffusion boxes was introduced in the 1930s, along with the laying of foundations for long distance telecommunication.

Lorries made a greater impact, especially in West Africa, where African entrepreneurship played a significant role particularly in the groundnut, cocoa and palm producing areas. They encouraged the construction and maintenance of roads, which paved the way for civil engineering projects. Assembly plants for motor lorries became a minor industry, and skilled mechanics were produced to maintain the vehicles. Because the railways were so rigid and capital intensive, they remained under strict control of the colonial authorities while lorries were more flexible and more amenable to African participation. With such African involvement in improved transportation, other developments such as passenger travel and improved postal services did not have to depend solely on conservative government policies. Air transportation to North Africa began soon after the First World War, and first crossed the Sahara in 1924. Regular civilian passenger movements did not begin until 1937 with the Imperial Airways London-Cairo-Khartoum-Johannesburg flights, with a branch line from Khartoum to Nigeria. That was the era of small associated airlines, small aircrafts, and several small airfields intended to supplement inadequate road and rail networks.

### Mining and metallurgy

Mining and metallurgy were of special concern to the colonial powers interested in investing capital and technology to exploit African resources. It was also an area where African miners had shown great skills and techniques. There is now clear evidence of widespread mining of iron, tin, copper and gold, all over Eastern Africa from the Cape to the Horn and in West Africa. Blacksmiths and goldsmiths operated throughout the continent and were held in such high regard that they constituted a sort of occupational caste. But the colonial powers, armed with their foreign capital and technology, undermined indigenous techniques and enterprise. Land surveys for settling boundaries did not only yield maps. They also sometimes identified valuable mineral resources, with subsequent mining activities across the continent: gold in the Gold Coast (now Ghana) and Angola, tin and coal in Nigeria, copper in the Congo and Rhodesia, and gold and diamond in South Africa and Angola. Licenses for prospecting and mining operations were granted to European firms and concessionaries to exclude indigenous African miners. Such European firms were able to import equipment for digging much deeper than any African miners could. Legislation was often enacted to protect imported European manufactured goods, such as guns, from local competition. Indigenous technology remained undeveloped, and local manufactures had to compete usually on unequal terms with imported tools and utensils.[10] The story was the same in other areas of indigenous technology such as glass fabrication and textile manufacturing.

## DECOLONIZATION AND APARTHEID

The Second World War broke out at the end of a decade of worldwide economic depression during which there was little room for investment in economic, cultural or scientific

development. It is not surprising, therefore, that there was a vigorous attempt to proclaim reform and renewal immediately after the end of the war in 1945. The British were determined that the 1940 Colonial and Welfare Act should be more effective than the mere gesture of the 1929 Colonial Development Act. Similarly, the French established FIDES (Fonds d'investissement pour le développement economique et social/Investment Fund for Economic and Social Development) with specific structures and programmes to make the Fund productive. After the Second World War, the Portuguese attempted to develop the colonial economy by transferring capital and introducing new development plans. At the end of the 1950s, the colonial towns of Luanda and Lobito in Angola and Beira in Mozambique expanded along with their food and textile industries. There was some international pressure that reform should be in the direction of decolonization. However, as the euphoria of the United Nations Charter and Declaration of Human Rights gave way to the politics of the Cold War, African peoples realized that they had to struggle and, in some cases, wage war to secure independence. Not only were the colonial powers ambivalent in their support for decolonization as they had been for educational development. Their linkage of decolonization with policies ranging from the advocacy of cultural adaptation with racist overtones, to rigid apartheid, gave a new twist to the perception of decolonization.

During the years of economic depression that bred fascism in Europe, right-wing fascist regimes sought to relieve the sufferings of the European poor by finding opportunities for them in the colonies at the expense of African peoples. As noted above, various schemes were conceived for massive colonization in Salazar's Angola and Mozambique, and Mussolini's Eritrea and Ethiopia. The British directed their poor to South Africa and the Rhodesias. Vichy France looked mostly to Algeria and, as much as possible, to tropical parts of Africa as well. Fascism repudiated the theory of trusteeship and institutionalized the doctrine of apartheid. This stimulated the rise of militant nationalism and a more active pan-Africanist programme committed to decolonization in Africa. Pan-Africanists and nationalists came together at the Manchester Conference of 1945 to claim the promise of the right to self-determination that was used to mobilize support for the Allied war effort. Apart from material resources, it was estimated that, in 1944, three-quarters of all the troops fighting on the French side were Africans. However, the colonial powers saw from the very scale of that support the vital contribution Africa could make to the post-war reconstruction of Europe. They thus perceived reform and decolonization as a means of linking African economies more closely to the European interests. To block decolonization, Portugal, for example, reinforced security and repression measures through its special security unit, the PIDE (International Police for State Defence). Moreover, Portugal's entry into NATO in 1949 did not change its colonial policy. The Belgians were similarly opposed to decolonization, and when forced to take measures in that direction, they ensured that decolonization would not work. The British and the French were more subtle, moving Africans towards political independence while deepening their economic, scientific and cultural dependence.

As noted above, the policies of the British Advisory Committee on Education called for adaptation of education 'to the mentality, aptitudes, occupations and traditions of the various peoples'. This was tied up with the policies of Indirect Rule, which chose to administer the peoples through 'tribal chiefs' to the exclusion of the Western-educated elite. In South Africa, where the majority of the African population were expected by law to be 'hewers of wood, drawers of water and beasts of burden' to the white populations, adapting education to the mentality and traditions of the people meant ultimately promoting 'Bantu education', separate and most unequal. Under those circumstances, for the African leaders, decolonization meant first and foremost a struggle for racial equality and political independence. Therefore, rather than reject European culture and seek a return to the pre-colonial past, the Western-educated elite embraced the colonial institutions created by the British and sought racial equality and political independence within these structures. The educated elite argued that the autocratic rule of chiefs whom the British were employing to control the peoples was disconnected from the democratic constitutions of pre-colonial states, which allowed for wide participation of families and associations. They therefore opted for the European patterns of democracy, with statutory laws and legal systems, based on the Westminster, Paris, Brussels or Lisbon model of constitutional arrangements, and the British policy of non-partisan bureaucrats in the civil service. In doing so, they embraced the idea of developing a modern sector of society based largely on the culture, science and technology of the Western world, which dominates and alienates the traditional cultures of the people. The rift between the colonial and traditional cultures constituted a major obstacle to growth and development.

In terms of cultural and scientific development, the most important single factor in the post-Second World War reforms and revival was the development of higher education based on the British, French and Belgian models and overseen by the metropolitan institutions. University institutions were established in Ibadan, Legon (Accra), Khartoum, and Makerere (Kampala) as colleges 'in special relationship' with the University of London, which controlled the curricula and granted degrees. An Inter-University Council representing the collective support of other British universities supervised the university colleges by recruiting staff and offering advice on development through quinquennial visits.

Similarly, a decree of the French Ministry of National Education enabled the establishment of overseas French universities governed by the same laws applicable to French universities with respect to admission, quality, autonomy, and the rights and privileges of academic staff. This led to the establishment of the University of Dakar in 1957, Tananarive in 1960 and Abidjan in 1964. After independence, each country negotiated agreements with France to include technical assistance to sustain the universities for a period before establishing them as national universities. Likewise, the Catholic University of Louvain in Belgium founded Louvanium (little Louvain) in Leopoldville (now Kinshasa) in 1954, while the Protestants created the University of Stanleyville (Kisangani), and the Liberals opened the University of Elizabethville (Lubumbashi) in 1956. The three were later merged in the multi-campus National University of Zaire. Long after independence, the staffs of these institutions were predominantly expatriates. British members of staff earned supplementary allowances from

the British Government over and above the salaries of the colleges' African staff. The number of students was restricted, and the range of subjects covered was also narrow, with an emphasis on the liberal arts, humanities and basic sciences rather than developmental subjects like the social sciences, applied sciences and technology. Their basic function was to produce trained manpower to replace expatriate staff in educational institutions and the civil service, and, only marginally, in production and development in the private sector.

The new university colleges were centres of cultural development and prepared the way for eventual incorporation of African material into their cultural programmes. They established departments of African Languages and Linguistics and Centres or Institutes of African Studies for the collection and analysis of oral literatures, religious ideas, philosophies, etc. But, as in Britain, the university colleges placed culture on two levels: a popular culture still predominantly oral and spontaneous for the mass of the people, and an elitist one, based on the written texts of European literatures, from which a university-inspired African Literature in English, French and Portuguese evolved. It was the products of the departments of English language and literature, and modern European languages – that is, French, Spanish, Portuguese, German or Russian – rather than of African languages and linguistics that, for the most part, produced new African literature. Many black African writers became famous for their contributions to African literature in European languages, and one eventually won the Nobel Prize in Literature (Nigerian Wole Soyinka in 1986). It could also be argued that they had, in the process, ensured that English, French and Portuguese would be counted among African languages.

It is noteworthy that Italian is not included in the list of European/African languages, because it did not succeed in displacing Amharic and Somali as the lingua franca. This held great significance for the cultural and scientific development in the countries of the Horn of Africa. The duality that exists elsewhere – elite culture in European/African languages vs. popular culture in indigenous African languages – poses the problem of the future of the indigenous languages and their role in development. It should be observed that some of these African languages – Hausa, Yoruba, Igbo, Peul/Fulah, Kiswahili, Sotho – are major languages spoken by 10 to 20 million or more people across several national boundaries. Adopting European languages as the lingua franca creates a problem of cultural identity, but it also solves the political problem concerning which indigenous language to select out of many. Some argue that maintaining European languages as the lingua franca facilitates international connections and the establishment of a Western scientific culture. Others, using the Japanese experience, claim that education in a foreign language encourages imitation and inhibits true creativity. A scientific language needs to be developed in the indigenous language if the tension between the working language and the thinking language of the scientist is to be eliminated, and if scientific and technological development is to become assimilated.

Concerning the fields of culture and media, graduates of the university departments of European languages taught in secondary schools, but also began replacing expatriates in broadcasting and journalism, cultural management, public relations and advertising. The art councils initially recruited traditional dance troupes from the rural areas to perform at national festivals before they began to organize and train troupes of their own and encourage the emergence of an urban-based popular theatre in African languages. Radio and television have been very useful in propagating popular urban culture, particularly music. At the same time, individual Africans, also encouraged by radio and television, have made notable contributions to classical music both as composers and performers. Only one major Kenyan writer (Ngugi) has rejected the dual culture and, after he had made his name as a writer in English, began to write and produce plays in Gikuyu. In Sierra Leone and Nigeria, university departments of theatre arts tried to bridge the gap by producing plays in Krio and pidgin English, which had a greater appeal and could support a travelling theatre performing to wider audiences on playing fields and open halls. The situation created by the doctrine of apartheid in South, Central and East Africa did not favour the separation of culture into popular and elitist. To a great extent, racism forced African literature – whether in African languages or in English – to adopt a political commitment. Literature had to be directed principally towards mobilizing and motivating the masses, except in the case of writers in exile whose readership was primarily the international elite community. Africans writers such as Amilcar Cabral and Agostinho Neto, who studied at the Caso do Império in Lisbon and founded the Centro de Estudos Africanos in the 1950s, became pioneers of the nationalist movements in the Portuguese colonies through their efforts to diffuse creative literature firmly rooted in the African continent. This direct involvement of literature in political action was the basis of Ngugi's experiment, which was also responsible for forcing him into exile.

Racial discrimination was a factor in the development of sports, and it partly explains the attraction of European sports for Africans. The more they were oppressed and discriminated against by the Europeans, the more Africans regarded sports as an essential part of the culture of Europeans, necessary for the relaxation of all those claiming to be civilized. The schools propagated European sports. Educated Africans learnt to excel in many different European games like cricket, soccer, athletics, hockey, handball, etc., while ignoring and despising their own traditional, sports like wrestling, palm tree climbing, and heap making.

The universities provided many opportunities for the development of the basic sciences. Qualified staff, mostly expatriates, were employed to teach Africans at the undergraduate level and, for those aspiring to university careers, also at the postgraduate level. The laboratories were adequately equipped for basic investigations in the chemistry of local materials, surrounding atmospheric physics and the biology of tropical plants and animals. This period witnessed the creation of numerous national and regional scientific research and technological institutions in many countries. World-class research was carried out in a number of them.[11] Initially, the scientists working in them were predominantly non-Africans, as the products of the universities were deployed into teaching and government research institutes and laboratories. Eventually, African scientists trained abroad and locally began making significant contributions. Notable achievements were made in the basic sciences, including pre-clinical sciences.[12] Likewise, advances were

also made in the fields of applied science – agriculture, veterinary health, and human medicine – and particularly in the study of soils and plant genetics. The most obvious gap was in technological education. The majority of engineers were still trained abroad, more in civil rather than electrical or mechanical engineering, and predominantly for posts in the civil service. Industrial engineering was slow to develop, and the private sector businesses and industries tended to import their own specialists and did little to encourage the transfer or local development of technology.

The exploitation of mineral resources was the only rapid means for some African countries to bypass the slow and laborious process of economic growth through agriculture. About one-seventh of the entire world's ore deposits are believed to be found in Africa, and many of the African mineral deposits rank as the major deposits of their type in the world. A considerable amount of prospecting and exploitation was accomplished in many African countries during the period of decolonization. This required an understanding of the basic geology, structure and environmental factors in the region. Geological research has been difficult and expensive due to the forest cover or the sand or laterite layer in many areas. The chances of finding minerals have, however, been increased in recent years with the improvement in prospecting methods due to new techniques of geophysics and geochemistry. This stimulated research in the departments of geology and physics in the university colleges.

The minerals of South Africa have made it one of the richest countries in the world, and undoubtedly, science and technology have contributed enormously to this development. However, little progress was made until the period of decolonization in Africa and apartheid in South Africa when the Research Organization of the Chamber of Mines decided to promote research locally to improve mining technology. It became clear that the mining system employed in the gold mines was outmoded. Since no large mining fields anywhere in the world had geological conditions similar to those in the Witwatersrand Basin, manufacturers of mining equipment lacked incentives to develop mining systems for such conditions.[13] When the directors of the mining companies were persuaded of the value of the contributions of research engineers and scientists, a concerted attempt to modernize the technology of the industry took hold. Local studies of rock mechanics, heat flow, rock breaking and related subjects were intensified. The ultimate aim was to control such problems as silica dust, 'the scourge of miners', so as to achieve better, safer and more rewarding working conditions for the thousands of men who laboured underground each day and, at the same time, to improve the profitability of the mining companies. Through the introduction of new, sophisticated technology, it was possible to extend mining to depths previously thought dangerous and impossible. However, as in the colonial period, the research and technological development in South Africa remained with the whites, and the blacks were excluded. The important point, however, was that improved technology was sought locally in Africa, and the exclusion of blacks could not be total or expected to last forever.

The copper mining industry, for example in Zambia, faced many problems similar to those of gold mining. Progress was made possible by exploiting developments in science and technology from abroad, without the capacity for self-reliance. Namibia, previously a colony of the white authorities in South Africa, is one of the world's greatest producers of diamonds. The work of mostly South African consulting engineers and geologists set the stage for major developments and large-scale innovative diamond mining, after the end of the Second World War, based on one of the biggest continuous Earth-moving operations in the world. In the 1960s, Angola's rich mineral resources were further exploited when Gulf Oil began research and extraction of oil in Cabinda, and huge sums were invested in gold mining in Cassinga.

In many African countries, this period also saw an increasing demand for electrical energy, both for domestic and industrial purposes. In its principal rivers, the African continent possesses the greatest hydroelectric potential in the world but one that cannot be exploited without access to science and technology. Some progress has been made in the building of hydroelectric projects, including one of Africa's largest man-made dams, the Kariba Dam on the Zambezi River between Zambia and Zimbabwe. The technology for these dams was, for the most part, imported from abroad, usually under contracts which provided for the recruitment and training of local maintenance staff. The dam projects also stimulated research and training in hydraulics and water engineering in a number of the universities.

Developments in the field of telecommunications overseas have inevitably found their way into Africa. Thus, after the Second World War, the telephone networks were extended and improved both by the transition from manual to automatic exchanges and by installing trunk lines in the colonies. In addition, the traditional telegraph technique was considerably improved by the introduction of the teleprinter, and the modest beginnings of telex networks were developed.

## ADVANCES IN POST-COLONIAL AFRICA

The decade of independence (1960s) produced much optimism for major advances in cultural and scientific development throughout the continent. There was optimism within Africa and considerable goodwill in the international community, which promised to extend substantial economic and technological support to the newly independent countries. But this assistance also tended to increase the degree of Africa's dependence on the wider international community. When the world economic climate worsened, and the politics of the Cold War reached dangerous levels, the amount of goodwill diminished, and the consequences of dependence became apparent in massive national debts that placed the African economies under the control of the 'advisers' from the international agencies. The overall economic decline was rapid, sometimes amounting to a crash, producing political instability if not outright structural collapse.

The countries that became politically independent realized the value of cultural awareness and, to some extent, the interaction between culture and development. There was thus some cultural revival in the use of national dress, names, food, and attempts to come to terms with traditional cultures in the pursuit of innovative change; but such attempts were often not wholehearted or effective. In

countries where independence was not readily forthcoming and liberation wars had to be fought, cultural awareness was a vital weapon in the struggle, particularly for mobilizing the people. However, as soon as independence was won, the former colonial power was transformed from enemy to the most important trading partner and technical assistance donor. In Zimbabwe, Namibia and South Africa, the settlers, rather than Britain, were the real enemy; and cultural links with Britain have remained an essential factor in the race towards development. Thus, it was soon evident that, whether independence came quickly or not, the pursuit of 'modernization' or 'development' in a state of economic and technological dependence could not be undertaken on the basis of cultural autonomy; technology, industrial plants, managerial skills, and whatever was borrowed from abroad, came not only with an economic tag, but also at a cultural price. Western culture continued to make its inroad via the mass media, especially television, school and university textbooks, industrial manuals and handbooks, etc. In their works, African writers explored different angles of the cultural situation and the contradictions between the values of the culture of the modernizing elite and the traditional cultures of the people. They may even have exaggerated the psychological pressures on the elite who had to live and operate within the two contradictory cultures. After a while, they began to move beyond the theme of the clash of cultures, as they became increasingly critical of the divisions, mismanagement, and abuses of human rights, etc., within the new states.

African countries tried to use the pursuit of excellence in sports and culture as instruments in the search for national and continental unity as well as to gain international recognition and acclaim. French-speaking countries in West Africa announced a 'ten-year plan' for the systematic study of oral traditions and the promotion of African languages as media of culture and instruments of life-long education. They sought the cooperation of UNESCO and the OAU (Organization of African Unity) in the establishment in Niamey, Niger, of a multi-cultural Regional CELHTO (Centre for Linguistic and Historical Studies based on Oral Tradition) devoted to the collection and publication of oral traditions and folklore. The Centre for Applied Linguistics was set up in Dakar, to work with departments of linguistics and oral literature in IFAN and the local branches of the former IFAN. Another body supporting local traditions is the CIEPAT (Inter-State Centre for the Promotion of Artistic Crafts and Cultural Tourism) at Abomey, the ancient capital of the kings of Dahomey. Biennial crafts fairs were held at Wagadugu for a number of years to promote handicrafts such as jewellery making, fabric dyeing and dress designing. Also noteworthy were the Dakar Biennale as the established venue for the African art market, while the biennial Wagadugu Pan-African Film Festival has continued to attract increasing international attention. Similar projects in other parts of Africa have also had some success in stimulating traditional crafts, and modernizing their technology. In this way, some African designs, such as the women's wraparound skirts, men's *dansiki*, and kente fabrics have entered the international market. The efforts at regional cooperation resulted in the Dakar World Black and African Festival of Arts and Culture in 1966. However, underfunding and management problems have hampered the growth of many of these institutions and cultural initiatives.

Within the framework of its Convention for the Safeguarding of the Intangible Cultural Heritage (2003), UNESCO has recognized several African traditions as masterpieces of the Oral and Intangible Heritage of Humanity. These include the traditional skills of the Zafimaniry community in the highlands of Madagascar, the cultural space of Sosso-Bala in Guinea, the oral heritage of Gelede in Benin and the oral traditions of the Aka Pygmies of Central Africa.

Nigeria tried to promote national unity through annual festivals of arts and culture, as well as national competitions in soccer and athletics championships. After emerging from the throes of civil war and thanks to the boom in oil prices arising from the Arab-Israeli War of 1973, Nigeria decided to stage the World Festival of Black and African Arts and Civilization (Festac) in 1977 as a follow-up to Dakar 1966. This festival, and several others, attempted to link development to culture, in the search for ways to exploit the culture of the people in order to establish the necessary base for modernization and development, even in the areas of science and technology. There is little doubt that considerable success was achieved in raising worldwide awareness of the quality of traditional African art and contemporary African literature. Similarly, African athletes, especially in long distance running, have won international acclaim, and African soccer teams have also made their mark. The degree of success achieved in using sports and culture to promote national or continental unity, or provide a secure cultural base for modernization, is more controversial.

As noted above, higher education, and the universities in particular, have been crucial to the development of culture, science and technology, and international support in the immediate post-independence period was most notable in these fields. The universities consolidated the achievements of the decolonization period and built upon them to meet the needs of cultural, scientific and technological development. The expansion and creation of African scientific and technological institutions – not only the universities, but also governmental research institutes, regional organizations and programmes – worked well in the period of relative affluence following independence. There were, thus, records of substantial scientific and technological achievements in post-colonial Africa. For example, in the field of agriculture, attention turned from cash crops to food crops. A number of research institutes at the national, regional and international level have been established and are conducting crucial agronomic studies and carrying out research on new plants and crop varieties, as well as improving production through genetic engineering. For example, the International Institute of Tropical Agriculture (IITA) at Ibadan, Nigeria, has made significant improvements in the production of African food commodities such as cassava, yams, maize and cowpeas, rice and sorghum. A number of institutions have been conducting research on water resources and their exploitation to enhance agricultural production. Others have pursued research on animal diseases and livestock production, as well as on African farming systems generally.

Post-colonial Africa was able to exploit the ideological struggle of the Cold War by sometimes playing one side against the other, when its demand for technology seemed likely to be ignored or rejected. Thus, Western capitalists refused to build the Volta River Dam for Ghana under

Kwame Nkrumah, until they realized that Czechoslovakia was ready to accept the job. When they refused to build the Aswan Dam for Egypt, the Soviet Union had to come to the rescue. Similarly, when the building of a railway from Tanzania to Zambia was obstructed, the socialist state of China stepped in in a show of solidarity with African peasants and workers. The two largest Portuguese colonies, Angola and Mozambique, embraced Marxist ideology, particularly in the early years of independence. In Angola's long civil war, the MPLA (Movimento Popular de Libertaçao de Angola) was heavily supported by the Soviet Union and Cuba.

Imported technologies provided by non-African allies greatly contributed to local communities as the level of science-based education rose. It is not surprising, therefore, that local geological survey departments, sometimes advised by foreign consultants, use the latest prospecting techniques to increase knowledge of mineral resources of all kinds in Africa. Recent improvements in geophysical and geochemical techniques have facilitated the discovery of new resources of rare metals and minerals for which new industrial uses offer an expanding market.

There has been some progress in the area of civil engineering for the construction of roads, railways, airfields, causeways, bridges, dams, high-rise buildings, etc. Such achievements have been made possible through research into the problems of structural design and constructional material, and adequate knowledge of the terrain, moisture content of the soils, the structure and nature of underlying rocks, and the depth of sound rocks below the surface when deciding on foundations for bridges, etc. All these are highly technical matters, requiring the combined efforts of the engineer, the geologist, the physicist, the chemist, the geographer and the pedologist. They thus require the application of science and technology and the exploiting of continuing innovations in meteorology and civil aviation in the world.

There has also been an increased demand for telecommunications services and facilities in Africa. National capitals, with their distinct political, economic and cultural conditions, have grown out of the 'remotely controlled' administrative capitals of the former colonies. The new capitals now host diplomatic missions from all over the world, which require efficient telecommunications systems. The growing press and news agencies make greater demands on telecommunications installations. Equally important has been the emergence of a new African executive class with the increasing need for telecommunications facilities consistent with their new lifestyles. Anglophone Africa, like the rest of the continent, thus continues to benefit from the accelerating advances in the communications field, and one can now find increasing use of new equipment for automatic telephone dialling, telegraph, telex, facsimile, e-mail, as well as use of satellite and Internet facilities. Similarly, in the energy field, hydro-engineering to harness hydropower has come to stay; while in the oil industry, the need for fuller exploitation of solar power, biogas, etc., and the production of coal briquettes have brought about new and exciting opportunities for Africa's scientific and technological development.

Local technology, particularly relevant technology, is also being generated as a result of the acquisition, innovation and adaptation of imported technologies to local conditions. Some transfer of technology is achieved through the acquisition of new machinery and equipment, maintenance services and on-the-job training. Along with Anglophone Africa, many other African countries have invested or been made to invest huge amounts of money in the acquisition of sophisticated scientific equipment for research in educational institutions and the provision of agricultural and health services. Such equipment requires regularly maintenance and repair. Unfortunately, the facilities available in many parts of Africa for proper maintenance are grossly inadequate. As a result, much apparatus is out of service for long periods of time, and large capital investment in expensive instruments and equipment is placed at risk. For research institutions, it is difficult to organize the research work and programmes and plans often have to be modified or aborted. This state of affairs is a direct impediment to the building and development of sound scientific and technological infrastructures in these countries.

Crises have sometimes acted as a spur to development. For example, scientists and engineers had some remarkable achievements in Biafra during the Nigerian civil war (1967–70). In the manufacture of weapons, electrical engineers and chemists working at the Products Development Agency (PRODA) made hundreds of mortar bombs, land mines, anti-aircraft rockets capable of flying some 2 km, hand grenades like the famous Ogbunigwe, and the armoured vehicle 'Genocide', which was built in Port Harcourt. At the forefront were civil engineers, who had to construct runways for airports. Within only four weeks, the Uli airstrip was constructed, with an air traffic control unit on wheels. As the civil war heated up, it handled the largest air traffic on a daily basis in the whole of Africa, with the possible exception of Johannesburg, and over 90 per cent of the traffic occurred at night time. They succeeded in building out of entirely locally fabricated materials a giant petroleum refining facility and thereby made the technology so diffuse and more universally understood and applied than anywhere else in the world. They also produced cement and used bamboo sticks as fractionalizing columns. Such seemingly impossible tasks were accomplished with dispatch, as when civil engineers had to wade in floods to build a three-mile pipeline from Eghana oil field to the outskirts of Oguta. Unfortunately, these were not followed up at the end of the civil war.

Apartheid had a similar impact on scientific and technological development in South Africa. During the period of international isolation, South Africa achieved significant scientific and technological breakthroughs in certain fields to ensure its own survival and integrity, though without the involvement of the majority black population. Isolation spurred direct investment meant to boost self-sufficiency in technology in several key industries, especially the automotive, oil refining and petrochemicals, telecommunications and computer industries. South Africa has no known oil or gas deposits. In order to achieve energy self-sufficiency in the face of increasing political isolation, in the early 1960s South Africa initiated measures to reduce the country's dependence on foreign oil and consequent vulnerability to a cut-off of supplies.[14] One of these involved the production of synthetic fuels. The country was able to make a major breakthrough in the conversion of coal to liquid fuel and other substances. Such processes were probably better established and more advanced than in most other countries where petroleum-based industries were predominant. Now a world leader in

the development and application of oil-from-coal technology, South Africa operates one of the world's few successful coal-gasification programmes. Not only is South Africa a major producer of uranium, but it invented and oversaw nuclear enrichment technology with the assistance of its erstwhile friends in the West. South Africa remains dependent on Western technology for the continued development of many of its strategic industries. The country's dependence on foreign technology is most evident in the areas of sophisticated electrical equipment, scientific instrumentation, computers, and nuclear energy. However, it has also become a modest exporter of technology. There has been some interest in the United States in the proven but expensive South African coal-gasification technology, as well as in its deep-shaft mining technology. South Africa's other exports in older technologies in agriculture, mining, and manufacturing are of particular interest to the states of the southern African region.

## PROBLEMS, SETBACKS AND PROSPECTS

The so-called African crisis has hit hardest in the realm of culture, science and technology. The optimism and promising indicators of development visible in most African countries in the 1960s and 1970s have given way to stagnation, if not regression and decay. This has been manifested in political instability throughout the continent and occasional structural collapse of the state system, including the decline of the educational system, available infrastructure, industries, and in general productivity and revenues in the face of rising inflation and unemployment. The methods by which most African countries have been trying to cope (e.g. one party state, military intervention, and even structural adjustment, privatization and so-called democratization) have complicated rather than alleviated the problems.

When we consider the entire African continent, it is clear that the crisis has produced a social, economic, cultural and political environment that presents a series of impediments to fruitful scientific and technological development. These include: (i) widespread superficial understanding of, and lack of political commitment to, science and technology (S&T) among the government leadership; (ii) the consequent marginalization of the national scientific and technological communities, as well as their achievements and capabilities; (iii) little public awareness of the importance of a strong scientific and technological capacity; and (iv) insufficient public and private demand for S&T. Competent scientists and technologists in many African countries are unable to maintain desirable contacts among colleagues. The institutions and opportunities that could facilitate such contacts are either grossly inadequate or, in some cases, simply non-existent. When good minds are so few and so scattered and unable to meet and stimulate one another, they lose the courage to persevere.

In a number of African countries, political instability has led to upheavals, ethnic conflicts and civil wars, in which the infrastructures of institutions for intellectual, scientific and technological work have been destroyed or abandoned. Such events have prevented many specialists – academics, scientists, technologists, etc. – from pursuing their

professional calling within their own countries. Finding that they can no longer carry on their scientific, technological, or scholarly work in a physically safe environment or with any degree of professional integrity, they are forced to seek safe havens elsewhere. These, together with the problems of insufficient and uncertain funding, are some of the major factors driving Africa's highly trained and skilled brainpower into DESSA (Distressed and Expatriate Scientists and Scholars from Africa) situations. These same barriers prevent new recruits from joining national institutions. The DESSA phenomenon, including the pervasive 'brain drain', poses monumental impediments to the scientific and technological development of Anglophone Africa and of the entire continent.

The national research systems set up with the support of donor agencies over the past 30 years have not, by and large, been able to sustain effective performance. Moreover, they often have a narrow focus and are aimed primarily at short-term solutions to specific problems rather than at strengthening African capabilities to solve general problems. In some cases, they have created an isolated research without a broad base of technically trained and experienced personnel. Moreover, a science-based culture in suitable technology adapted from the international centres to a receptive peasantry has not emerged. Unlike university research, their work is seldom subjected to peer-review scrutiny, and this has sometimes led to mediocre results. Their budgets have generally been drastically cut in response to government revenue shortfalls, and although their budgets may look adequate on paper, there is actually seldom money for equipment, periodicals, fieldwork, or anything else beyond salaries, which are frequently not paid on time. The systems have been able to retain competent personnel only as long as better opportunities were not available elsewhere. The entire apparatus of government research has tended to collapse whenever donor support was phased out.

By the 1970s, many African countries had established bodies that, at least officially, had comprehensive responsibilities for developing science and technology policy, which cover the gamut of government measures necessary for augmenting the nation's scientific and technological capacities and adapting them to the process of economic and social development. However, the dominant approach used in designing those organizations was to imitate bodies responsible for 'science policy' or 'science and technology policy' in the developed countries. Not surprisingly, the scope of the institutional 'clones' set up in Africa was usually too narrow for the needs of African countries – limited essentially to resource allocation to different areas of research and development.

To complicate the problems faced by individual organizations, the overall structure of scientific and technological institutions for exploiting the potential of science and technology in Africa is usually disarticulated and functionally incoherent. 'For example, even where excellence is achieved, scientific research too often seems weakly linked to technological development. In turn, technological research and development, whether in universities or specialized research organizations, has generally remained functionally disconnected from the use and application of technology in agricultural and industrial production'.[15] In most countries, this also applies to industrial production. But even in agriculture, research has

had a very limited impact on the technology used by farmers – except in the case of a few crops in specific geographical areas. Agricultural research is often carried out with little direct collaboration with farmers; and institutions concerned with education in agricultural technology have little to do with the training of farmers who use that technology.

Africa's problems in developing coherent institutional structures for exploiting science and technology in production are not, of course, unprecedented. Very similar problems had been experienced by other societies. Indeed, the earlier experiences of those other societies had several features in common with the current experience of Africa. 'As they sought to accelerate industrial and agricultural growth, all of them had weak scientific and technological capacities. All of them had to create new institutional structures and new human resources in order to exploit the potential of science and technology. They all had to overcome their scientific and technological weakness in an international context in which other societies had already established dominant economic, technological and scientific strength'. Arguably, Africa faces an unprecedented task, as none of those other more developed countries had sought to overcome their scientific and technological backwardness in the context of late-twentieth-century science and technology.

Issues about developing the 'human capital' needed for industrial development have not, of course, been ignored by policymakers and their advisers. But policy concern about those issues has been somewhat circumscribed. It has tended to focus principally on allocating resources to the education and training infrastructure, i.e., on the development of institutions that will generate human resources for industry. Furthermore, it has centred primarily on the development of human resources for using and operating given technologies, not the resources required to generate and manage change in those technologies. Development and the accumulation of industry's human resources for generating, absorbing, and managing technical change have fallen through the yawning gap between 'science and technology policy' and 'economic policy' as presently conceived and practised.

Several cases illustrate this point. When the copper mining industry in Zambia was nationalized, little was done to train Zambians in creative engineering to the levels of expertise attained by their former expatriate managers. Another example of insufficient intra-company training of African engineers can be seen in a range of industries in Kenya (e.g. sugar, railways, cement, and metalworking). With few exceptions, even the training provided for operating, maintaining and managing existing production systems was fragmentary and unrelated to specific tasks or skill-development programmes. As for training that might equip African engineers with the capacity for improving existing technologies, it was almost totally absent. In many African countries, the growth of relatively large-scale textile manufacturing has been a significant component of industrial expansion. But a number of studies have indicated that, after two or three decades, the growth of the industry's production capacity has been accompanied by little or no growth in its technological capacity. For example, in the United Republic of Tanzania, there was no acquisition of higher-level expertise in management, let alone in areas such as textile engineering, fibre technology, or textile chemistry.

Even more gloomy prospects are in store from the likely impact of a number of technologies taking shape in industrially advanced countries today. These include *biotechnology*, which promises to undermine African biodiversity through alternative production of transgenic species by gene cloning and other means; *biomaterials technology*, which promises to undermine the export position of non-agricultural export products crucial to a number of African countries; *micro-electronics* will probably undermine the comparative advantages of cheap labour that previously induced trans-national corporations to locate industrial production units in Africa and other Third World countries; and the computer-assisted technological advances that are rapidly and extensively changing *communication and information systems*, offering great potential only for those countries able to take advantage of them. Such changes confirm the need to develop scientific and technological capacity to enable African countries to participate and reap benefits from the new technologies, rather than remain their victims.

Some new technologies, such as solar energy and energy from biogas, are likely to exert beneficial effects on African economies and societies in the long run, but they may be damaging in the short- to medium-term while national capabilities for their adaptation and beneficial use are being built up. The United Nations Office for Science and Technology for Development has been spearheading a project to design, install and test alert systems. The aim is to give early warning to policymakers and planners in Africa, as to which of these far-reaching developments might affect such countries adversely or which, if adapted quickly enough and exploited, could be of great value. It is clear that no matter how well an alert system is designed, the crucial point is the quality and scope of national capabilities for response, as well as paying attention to environmental sustainability in the face of development options. The quality of such response will depend not only on the government and the civil service, but also on institutions of higher education, R&D organizations and, above all, on local entrepreneurs.

## CONCLUSION

Many people often fail to see the relationship between culture and the development of science and technology. Development implies the healthy growth of a society, and culture is the life of the society. One cannot achieve scientific and technological development if it is pursued as an end in itself. When science and technology are imported from abroad, it remains foreign until it is integrated into the culture – that is, the everyday life – of the people. Education is the process by which integration takes place and growth is stimulated. The political will required to provide the motivation and the direction of development, as well as the economic sinews, are based within the culture.

The colonial legacy in Africa has created a modernizing sector of society that is dependent on the culture, science and technology of the Western world and is alienated from the traditional culture and technology of the people. The dangers of this cleavage as a barrier to development has been pointed out again and again but, because of much talk and less action, little has been achieved. Africa has so far failed to outgrow its colonial legacy of dependence and

disorientation. Africa therefore remains not only dependent but also backward, and this is most obvious in the area of science and technology as well as in the field of cultural development, which remains crucial in the struggle to overcome the current technological backwardness and the widening gap between Africa and the rest of the world. It is only through an understanding of the proper relationship between culture and development that Africa can hope to reverse the current tendency towards imitation and to re-establish links with its creative and inventive spirit in order to encourage innovation and creativity.

There is no easy answer to the problem of cleavage between Western and traditional culture. While elite culture seeks to come to grips with practical science, and the application of scientific knowledge in agriculture, medicine and technology, popular culture remains suffused with beliefs in the occult, the supernatural, and the reality of myth. There has been some attempt to codify these beliefs and promote para-psychology, occultism, magic and, perhaps, even sorcery as 'an African account of nature and how it works … which could replace the so-called Western sciences'.[16] Yet just as the African approach to holistic medicine has now been generally accepted in the West, so are modern studies of complexity, chaos and instability redefining the nature of Western science itself. These studies are breaking down the barriers between social and biological sciences, and between religion and science, and science and the humanities, in the manner of traditional African beliefs. Perhaps further research into the patterns and connections of African thought and beliefs, such as Robin Horton and others have been exploring, might give rise to the theoretical framework for a coherent logical system to unite African philosophy, religion and science. Western science and technology could play a role in such an inquiry and help to bridge the gap between popular and elite culture in Africa. However, because of the colonial legacy, African governments have chosen the university-based culture and the science and technology of the West as the path to modernization and development. The task is to follow this path with greater commitment and professionalism and carry the masses along, while seeking a balance between 'African science' and Western science and technology that may lead to an African renaissance.

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# 36

## SOUTH AND SOUTH-EAST ASIA

*Dhruv Raina and Syed Irfan Habib*, coordinators

## INTRODUCTION

*Dhruv Raina* and *Syed Irfan Habib*

The colonization of South and South-East Asia was completed by the end of the nineteenth century. The processes of decolonization of the two regions were well underway by the mid-twentieth century (Map 19). Until that time, several Western colonial powers had shared dominance over the two regions: Great Britain ruled the Indian subcontinent and Sri Lanka, while the Netherlands controlled Indonesia, and the United States dominated the Philippines. Thailand, the region's sole sovereign nation, had to invent a number of ingenious strategies in order to maintain its sovereignty. The two regions shared common experiences as modern science and technology emerged. Nevertheless, their distinct historical and cultural locations shaped the institutionalization of modern science in these nations along different lines. As these nation-states emerged from decades of anti-colonial struggle, their paths to modernization revealed a variety of political and cultural complexities. The modern structures of generating knowledge, such as the university and the scientific institutes that had emerged in Europe, occupied a primary place in the projects of these new states, marked as they were by their regional cultural particularities.

Modern universities and research institutes took root in India at least three decades earlier than in other parts of South-East Asia. Following the partition of British India, India inherited most of the scientific institutes and the universities. This advantage was reflected in the creation of scientific institutions and practices that were relatively stable well before India became independent. The formal end of colonial rule was marked by the emergence of several modern nation-states. The process of decolonization was premised on a sovereign commitment to societal and economic development. The programmes of development were often conceived, debated, refined and revised during the period of anti-colonial struggle and found expression in projects and plans that were implemented after independence. Modernization through science and industrialization were the crucial ingredients of these projects. The priorities of science and scientific research

varied not only between nations within the same region, but also between regions. In addition, the importance accorded to science in each nation differed from that of its neighbours. India appeared to have reaped the benefits of a political establishment that favoured science during the first two decades of independent rule. In Sri Lanka, however, the relationship between the political elite and the scientific establishment was not marked by the same kind of trust. As a result, changes in the scientific and technological system initiated were at variance with the perceptions of the scientific community.

Intellectual decolonization was reflected in a change in historical perspective and emphasis, a change whose impact was still evident on the social sciences three decades later. Referring to a historiographic revolution in the last decades of the twentieth century, American social scientist Sandra Harding recently pointed out that post-colonial science studies had effected three important changes. Firstly, it helped give a new perspective on the integrity of European scientific disciplines. Secondly, it clarified the nature of the relationship between European and non-European cultures. In addition, these studies specified the nature of interaction between European and non-European sciences and went on to provide a different perspective on how modern science was reconstituted as a result of the encounter with the knowledge forms of the non-West. The articles comprising the present chapter reflect the spirit of this new perspective, as they were written by some of the scholars who have contributed to this change.

This chapter intends to demonstrate that while modern science, as a Western cultural import and with its markedly distinct institutions, was assimilated within the region, the process is interpreted differently today. The idea of the civilizing mission has been replaced by the notion that the so-called expansion of European sciences was catalysed by the combined efforts of imperial bureaucrats, their scientific entourage and indigenous traditions that viewed this encounter as a path to revitalization. Seen from a certain distance, the process could be perceived as a sort of 'trading

zone' in which so-called indigenous knowledge forms transacted with the practices of modern science, though frequently in the idiom of modern science. This dynamic relationship constantly reshaped modern science. Consequently, the growth of modern science and European colonial expansion were inextricably linked. This has naturally prompted a number of post-colonial critiques of both science and modernity. However, this is not the issue to be debated here. Nevertheless, these undercurrents are perceptible in some of the articles, just as others are marked by the optimism that science would be able to promote development if it were given the chance to do so. Consequently, the politics of science is more or less a backdrop for any discussion for science in the former colonies.

The process of decolonization was not a purely cultural endeavour. Rather, it involved the reconfiguration of the institutions of colonial science, dovetailed to serve the politico-economic policies and programmes of the new nation-states. This task was rarely conceived as the demolition of British legacies, but one of pragmatically assimilating elements that were suited to the post-colonial developmental agenda. In the South Asian region, however, the imperatives of hard-earned sovereignty and the pressures of maintaining economic self-reliance created pressure to leap-frog into the regime of international science. Any perceived interest in the scientific past in India was indeed subordinated to the more demanding pressures of the fast globalizing scientific research system.

The movements for independence from colonial rule had planned for the rapid creation of educational and scientific infrastructure after colonialism. The main actors in the political formations that spearheaded these movements were involved in the planning process and drawing up of programmes for the post-independence institutions of scientific, technological and industrial development. Since the scientific leadership were closely involved in the anti-colonial struggle, they acquired a great deal of latitude with the post-independence political leadership in negotiating and fashioning the destinies of the scientific and technological institutions of the independent nations. The political legitimacy conferred by the state on science, and vice versa,

*Map 19* **Decolonization and new states in East Asia (after 1945)**
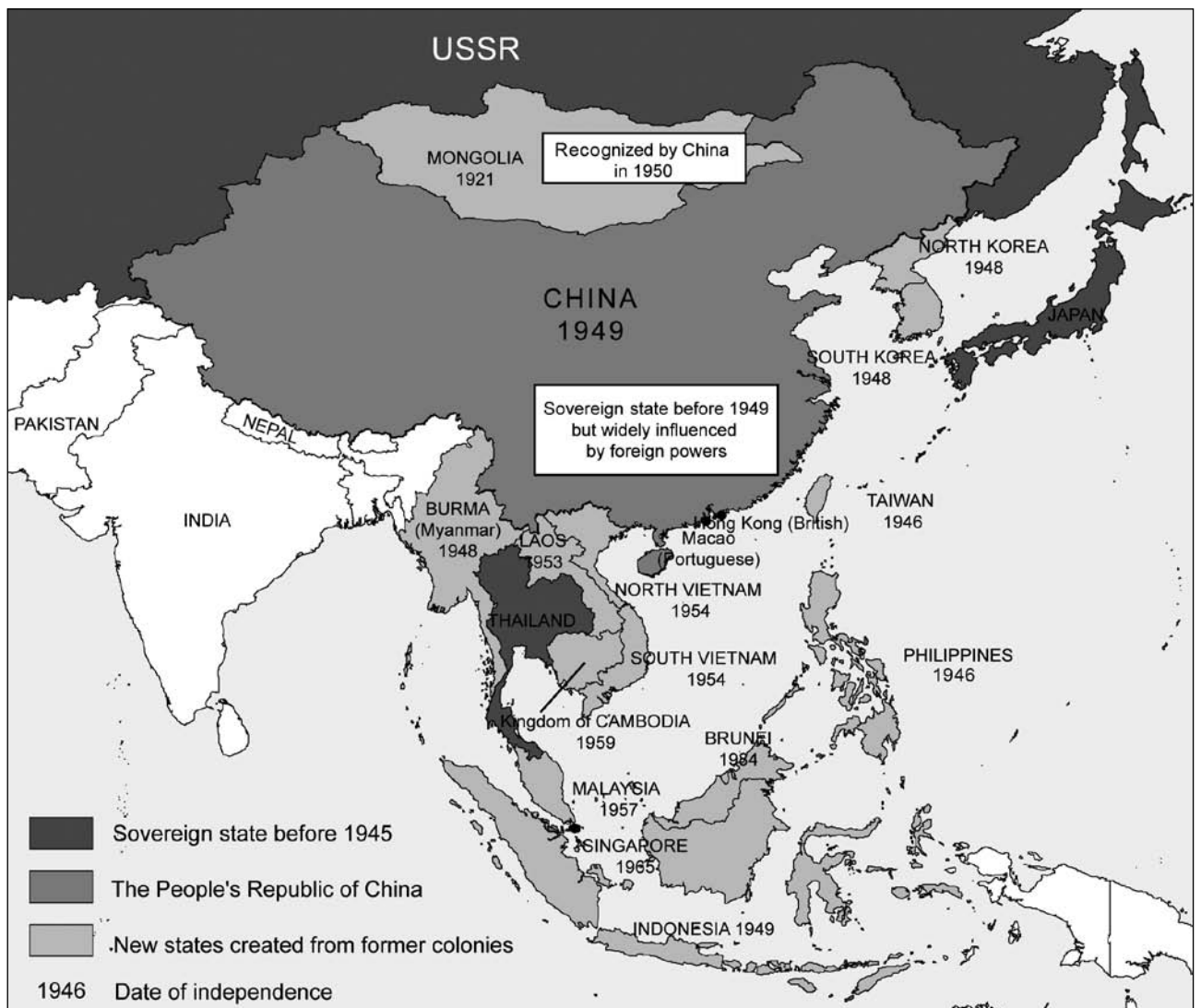


Adapted from G. Chaliand et al., 1997, *Atlas de l'Asie orientale, histoire et stratégie*, Seuil, Paris, p. 56.

facilitated the rapid building of scientific institutions. In the case of India and Pakistan, a number of strategic areas of scientific research were protected from bureaucratic and political intervention, which created the illusion that science was autonomous of the social institutions that gave it legitimacy. The dualist character of the economies of the region further reified this chimera of autonomy. The dualist economies of the South Asian region certainly prevented science from developing its full potential.

Consequently, by the last decades of the twentieth century, a number of factors – some strategic, others having to do with the pressures of catching up with the global sciences – skewed the research priorities of the South Asian region either towards strategically important science or market-driven science of the advanced capitalist world. The social agenda of science of the early half of the nineteenth century was thus replaced with that of a neo-liberal ideology. This may have catalysed the internationalization of science, but it also produced a disconnection between the scientific research system and internal social demand. This was not a purely regional phenomenon: UNESCO responded with a conference to discuss a new social contract for science.

During the period immediately after the demise of colonial rule, the commitment to economic self-reliance and the compulsions of national security generated policies oriented to building indigenous scientific and technological capabilities. The articles in the present chapter chronicle diverse aspects of this history. The cultural, educational, institutional and cognitive responses to modern science and industrialization, in the context of the struggle for liberation from colonial rule, constitute the substance of the articles. Consequently, a number of geo-political as well as internal economic crises in the 1960s and 1970s played a crucial role in re-orienting research priorities, such as the thrust towards the 'Green Revolution'. On the other hand, the amplification of strategic and defence considerations steered funding towards the scientific research system and established technological priorities that enabled a limited leap towards the frontiers of high-technology. Thus by the 1970s, a new contract was

worked out between civil society, strategic and defence interests and the world of science. In areas such as satellite research, a great deal of effort had to be devoted to *indigenization* since the international marketplace of science was closed to the import of technologies of strategic importance. Similarly, the Cold War compelled governments to invest in defence research. This resulted in sub-contracting research to scientific institutions that took advantage of this opportunity to build scientific and technological capabilities. The end of the Cold War has not yet prompted a conversion of defence research establishments to civilian research facilities.

At the dawn of the new millennium, we could ask how many dreams have been realized, and how many have gone awry. In terms of scientific institutions, there exist a number of regional disparities. As pointed out by one of the authors, India has the densest network of scientific institutions after China. But as is reflected repeatedly in several of the articles, the impact of science of the two regions is not as significant as is desired. This impact is measured in terms of citation figures and the quantum of research output in influential research journals. While a number of theoretical objections may be raised in opposition to scientometric analysis, the fact remains that these figures are indicators of the infrastructure of science in the region. Among the countries that set out on the path of development, India and Pakistan could claim achievements in certain areas of advanced science and technology such as space exploration, nuclear technology, telecommunications and information science, but the problems of poverty and hunger remain. The population explosion, environmental crises, and the range of ethical and moral crises engendered by the rapidly advancing biotechnologies will bring to the fore new issues that need to be addressed politically by 'knowledge-societies'. The negative effects of globalization appear to be accumulating in developing economies as the state withdraws from the areas of health and education and essential infrastructure. The manner in which this situation will shape regional research priorities and scientific institutions remains to be seen.

# 36.1

## WESTERN THOUGHT, EDUCATION AND SCIENCE IN INDIA

### *Aparna Basu*

### INTRODUCTION

The decision to introduce Western education in India, as a result of Macaulay's famous Minute and Lord Bentinck's Resolution, was a momentous step taken by the British Raj, and the year 1835 could be regarded as an important landmark in the history of modern India. Throughout the non-Western world in recent centuries, the process of modernization has been accelerated by contact and conflict with the West. The introduction of Western education was one of a series of acts which opened the doors of the West to the East. The impact of Western thought, though limited to the urban intelligentsia, was significant, as this class, though small in number, played a crucial role in shaping modern Indian history.

It was no part of the East India Company's policy during the first two generations of its rule in Bengal to impose a Western system of education. The Company was a trading corporation and its primary interest was in making a profit. The immediate reaction of its officers was to support the existing system of learning since they did not want to tamper in any way with indigenous institutions. But the Evangelicals, Liberals and Utilitarians soon questioned this early policy in England of encouraging Oriental education. While there were numerous differences between them, they were all agreed that Indian society had to be radically transformed and European education was one way of doing so.[1] The plan of supporting Oriental institutions was condemned by James Mill as 'originally and fundamentally erroneous'[2] because the aim of education was promotion of useful learning rather than 'obscure and worthless knowledge.'[3]

The earliest efforts to introduce any formal education beyond the indigenous knowledge came from the missionaries. Rich citizens of Calcutta, Bombay and Madras also came forward to set up English schools in collaboration with individual European officials and businessmen. In Calcutta, Ram Mohun Roy, together with David Hare and others, founded Hindu College in 1817, the first secular institution in Asia to give Western education in English. Almost a decade later the Elphinstone College was started in Bombay. The number of such schools and colleges started increasing, and British rule gradually supplanted the pre-colonial indigenous system of education, imposing a new language and curriculum.

The first three modern universities of Calcutta, Bombay and Madras were founded in 1857. Like London University, on which they were modelled, they were purely examining and affiliating bodies which undertook no teaching or research. The actual teaching was done in the colleges, but the university, which also conducted examinations, laid down the syllabus. Indian universities were meant to be instruments for strengthening British cultural and intellectual domination. European learning was the staple of the curriculum, and the fundamental aim was the diffusion of 'the improved arts, sciences, philosophy and literature of Europe.'[4] This was accomplished through the administrative structure, the curriculum, and the language of instruction. Initially, the Vice Chancellors as well as the Registrars and other high academic officials as well as Principals and staff of government colleges and of many private colleges were recruited in Britain, and there was close personal contact between the teachers and students. The influence of Derozio on his students in Hindu College in the 1830s[5] or of Professor Patton on students of Elphinstone College, Bombay, in the 1840s and 1850s is well known.[6] English influence on Indian higher education until the First World War was very pronounced. As Charles Wood conceived it, the Indian university had two main functions – to provide a test of eligibility for government employment and to transmit an alien culture.

Despite the alien character of the new system, there was an eager response to it, especially in the metropolitan cities of Calcutta, Bombay and Madras, and later in Lahore, Allahabad, Agra and in other cities where there were greater opportunities for Indians to find jobs in the government or in professions like law, teaching or journalism. Young men also took to it because it opened up new ideas and visions; as Gopal Krishna Gokhale said, it liberated the Indian mind from 'the thraldom of old world ideas.'[7]

From 1911 onwards, there was a growing disillusionment with the model of affiliating universities. The first university to deviate from the affiliating model was Benares Hindu University (BHU) set up in 1916, the same year as Mysore University, which was the first university to be established

in a princely state. BHU was a unitary, teaching and residential university. In 1917, the Calcutta University Commission was appointed under the chairmanship of Sir Michael Sadler. One of its major recommendations was the setting up of unitary, residential and teaching universities. If the first three universities were modelled on London, the Oxbridge model inspired Sadler and his colleagues. Of the universities set up between 1917 and 1929 at Aligarh (1920), Lucknow (1921), Dacca (1921, now in Bangladesh), Delhi (1922), Nagpur (1923), Andhra (1923), Agra (1927), and Annamalai (1929), only Nagpur, Andhra and Agra were unaffiliated. The rest were all teaching and residential. Apart from Osmania University in Hyderabad, the medium of instruction everywhere was English. The Depression of 1929 put an end to the opening of new universities. Between then and independence only one university was founded in the princely state of Travancore and three universities were set up in British India – Utkal (1943), Saugar (1946) and Rajasthan (1947).

## SCIENCE AND TECHNOLOGY UNTIL MID-CENTURY

Since the primary function of colleges and universities was conceived of as diffusion of Western culture it was natural that priority was given to the study of English language and literature. The Indian component in the curriculum increased after 1921 but Western learning still continued to be emphasized. Not only was the curriculum Western in orientation, but it also tended to ignore scientific and technical education. The Hindu College had been established in order to cultivate 'European literature and science' and the original curriculum was 'comprised of not only reading, but also instruction in history, geography, astronomy, chemistry and other sciences'.[8] Ram Mohun Roy in his famous letter to Lord Amherst in 1824 pleaded for the instruction of European sciences.[9] The Native School Book Society, founded in Calcutta in 1817, prepared textbooks in Bengali on geography, astronomy and natural sciences. A similar society was formed in Bombay. It was through the publications of these societies that Indians first became acquainted with Western science. The British introduced modern science and technology as a substitute for and in opposition to the traditional system of Sanskrit and Arabo-Persian learning.

Although Wood's Despatch of 1854 made specific references to the spread of Western science, and the Indian Education Commission of 1882 and the Calcutta University Commission in 1917 suggested the inclusion of natural sciences and vocational and technical subjects, these recommendations were not implemented. The bias was very much in favour of general or liberal education. Instead of training scientists, technologists or agronomists, Indian higher education was engaged in producing office clerks. In 1916–17, nearly 80 per cent of the total enrolment in Indian universities was in general education. Till then there were only four government-engineering colleges, which offered degree courses only in civil engineering, as civil engineers were needed for the construction and maintenance of roads, bridges, canals and buildings. Electrical engineering was first taught at the Indian Institute of Science in Bangalore. The first-degree classes in mechanical and electrical engineering were started by BHU in 1917. It was not until the 1930s that the Sibpur, Poona and Guindy engineering colleges introduced degree classes in mechanical and electrical engineering. Until 1947, the Dhanbad School of Mining (Bihar) was the only full-fledged school of mining and it accepted only ten students a year. BHU also provided a graduate course in mining. Until the First World War there were only four medical colleges. Higher posts in the engineering and medical services were reserved for Europeans and the availability of jobs for technically qualified Indians was extremely limited.

British policy towards science and technology in India until the Second World War is a story of improvisation. The main factors influencing the official attitude during these years were the economic interests of the Raj and the empire and their military and political requirements. Local needs and indigenous demands exerted their influence only occasionally. A few salaried scientists and technically qualified persons were employed in government scientific services for routine research on field sciences. While important results did emerge from these efforts, the facilities were restricted and hence there was very little scope for scientific research. While the policies and the involvement of the foreign government in scientific and technical education were, as could be expected, in furtherance of their own interests, some Indian intellectuals and people of vision, who were themselves the product of such an education, provided new leadership. The last quarter of the nineteenth century and early decades of this century witnessed personalities like Mahendralal Sircar, Asutosh Mookerjee, Jagadish Chandra Bose and P. C. Ray who were instrumental in heralding Western science, teaching and research into India. Sircar, a graduate of Calcutta Medical College, realized that to develop a capability for original scientific work, research has to be institutionalized, research scholars have to be remunerated, well-equipped laboratory and library facilities provided, high-level lectures and discussions instituted, and facilities for communication among research workers provided through conventions, seminars and publication of journals.[10]

The technical and scientific education that was introduced by the government was meant mainly to meet its needs and requirements. Curzon and his successors wanted to spend money and effort on technical and industrial schools, not on higher scientific or technical education. The Indian intelligentsia was not interested in industrial schools that would teach weaving, carpentry or leather crafts. They wanted more polytechnics and engineering colleges. Rao Bahadur R. N. Mudholkar introduced a Resolution in the Imperial Legislative Council in 1910 for the establishment of a Polytechnic Institute. Mohammad Ali Jinnah, later Pakistan's first Governor General, supported him, among others. But such proposals coming from Indians were always dismissed by officials as vague and impractical or showing lack of appreciation of the difficulties of the problem. Curzon rejected them as 'native clamouring for things about which they know nothing.' And the Viceroy of India, Lord Minto, was assured by officials that 'such harmless platitudes' deserved no serious considerations.[11] Jamshedji Tata's scheme of setting up an institute for scientific research took almost thirteen years to bear fruit.[12]

Since the 1880s, educated Indians had been pressing for more government expenditure on technical and scientific education. The Indian National Congress at its annual sessions always passed a resolution stressing the imperative

need for technical and scientific education, as did newspapers with a nationalist bias. The leaders of the swadeshi movement in Bengal started a college of engineering and technology at Jadavpur in 1907, which is at present one of the important centres of technical education in India. While other national schools and colleges collapsed ignominiously, this technical college survived, which was itself a proof of the demand for technical education.[13]

Curzon's much-maligned Indian Universities Act of 1904 permitted Indian universities to undertake postgraduate teaching by appointing 'university professors and lecturers, to hold and manage educational endowments, to erect, equip and maintain university libraries, laboratories and museums ... which tend to the promotion of study and research.' Sir Asutosh Mookerjee (1864–1924), a mathematician of high attainments and then Vice Chancellor of Calcutta University, seized on this one section of the Act as the wand with which to convert Calcutta University into a teaching and research institution.[14] The Government of India was not willing to give any money for the establishment of academic Chairs or for laboratories, as it regarded Calcutta University as highly political and anti-British. But thanks to the provision in the Act for the acceptance and management of educational endowments and the princely endowments of Taraknath Palit, a lawyer and nationalist, and Rashbehari Ghosh, an eminent jurist and scholar, Sir Asutosh was able to establish the University College of Science and Technology.[15] These and other endowments that followed soon enabled the appointment of full-time professors and research scholars. According to the terms of the endowments, the positions of professors were to be filled by Indians and the principal duties of the incumbents would be to carry on original research with a view to extending the bounds of knowledge, to stimulate and guide research by advanced students and to arrange for the instruction of students preparing for B.Sc., M.Sc. and D.Sc. degrees. Research and training in science thus began in Calcutta University despite the Government of India's reluctance to assist it. Acharya Prafulla Chandra Ray, who was already a distinguished teacher at Presidency College and internationally renowned for his work in isolating mercurous nitrate, was the first Palit Professor of Chemistry, and C.V. Raman (later a Nobel laureate), the first Palit Professor in Physics, was appointed in 1917. Ganesh Prasad was the first Professor of Applied Mathematics and S. P. Agarkar was the occupant of the Ghosh Chair of Botany. Jnanendra Chandra Ghosh, Meghnad Saha, Satyendra Nath Bose, Sisir Kumar Mitra were some of the distinguished scientists associated with the University College of Science. Sir Asutosh tried to get the best scientists from all over the country and wanted to make the College of Science an all India college 'to which students would flock from every corner of the Indian Empire, attracted by the excellence of the instruction imparted and the facilities provided for research.'

There was considerable interaction between the University College of Science and the Science Association. The University had the endowed chair but no physical laboratory at that time, while the Association's case was just the opposite. The two complemented each other. The scholars appointed from the endowed funds who were interested in working under the guidance of Raman found an excellent laboratory in the Association. The combination of a full-time research guide, research scholars, well-equipped laboratories and libraries stocked with the latest publications soon produced good results in physics, chemistry and other branches of science.

The First World War exposed India's industrial backwardness and her dependence on others for a variety of commodities, such as machines and industrial equipment, and technical and scientific skill. As the country was an important source of manpower and munitions, the governments both in Britain and India recognized that it must become more self-reliant scientifically and industrially. An Industrial Commission was appointed in 1916 to examine steps that might be taken to lessen India's scientific and industrial dependence on Britain. The Commission – presided over by Sir Thomas Holland and including some leading Indians such as Jamshedji Tata, Rajendranath Mukherji and Pandit Madan Mohan Malaviya – proposed that 'In the future the Government must play an active part in the industrial development of the country' and this would not be possible unless there was 'reliable scientific and technical advice.' The Commission identified the absence and misdirection of technical and industrial education as one of the significant causes for India's industrial under-development. It recommended a comprehensive scheme of technical education and a closer relationship between scientific workers, government departments, universities, scientific institutions and industries, and between industrial education and local industries. It recommended the creation of a specialized imperial scientific service to be manned by Indians and wanted government to encourage the formation of scientific societies. The scope of the recommendations was broad, covering many aspects of industrial development, including the establishment of mechanisms to expand scientific education.[16] But few of the Commission's recommendations were actually implemented. Most of the subjects involving science and technology, like education, industry, agriculture, health, etc., were transferred to provincial control under the Montagu Chelmsford Reforms of 1919. Mahatma Gandhi's opposition to Western technology and large-scale industrialization lessened somewhat the nationalist pressure on the government for starting new industries and for higher scientific and technical education.

The commercial needs of the British led them to think about Indian agriculture in scientific terms. A beginning had been made in agricultural education by the establishment in 1905 of an Imperial Agriculture Research Institute at Pusa in Bihar. In 1916, two conferences were organized by the Government of India, one at Pusa and another at Simla, to discuss the question of agricultural improvement. But under the 1919 Reforms agriculture became a 'transferred' subject, i.e. in charge of the provinces. Nevertheless, the Indian Central Cotton Committee appointed in 1921 and the Imperial Institute of Animal Husbandry and Dairying in 1923 gave a new orientation to crop research and animal sciences respectively. The Cotton Committee, set up to promote the production and exploitation of cotton, established a technical laboratory at Bombay (1924–25) and an experimental station in Bikaner (1930). A Royal Commission of Agriculture was appointed in 1926 under the chairmanship of Lord Linlithgow to examine and report on the condition of agriculture and the rural economy of India with particular reference to the measures being taken for promotion of agricultural research and veterinary research. As a result of the recommendations of the

Commission, the Imperial Council of Agriculture Research was established in 1929 with the object of guiding, and co-ordinating agricultural research and education. Central Commodity Committees dealing with research in particular crops were set up, such as cotton (1921), jute (1936), sugarcane (1944), tobacco (1945), coconut (1945) and oilseeds (1947). These were semi-autonomous bodies financed by grants from the Government of India or by income from cesses levied under specific Acts. Agricultural research was compartmentalized into particular crops and institutions without co-ordination at any stage.

Little attention was paid to agricultural education. In 1921/1922, there were six agricultural colleges with 445 pupils. By 1947/1948, there were 29 agricultural colleges with about 5,000 students. The agricultural courses had, however, little relevance to the practical needs of Indian agriculture. There were hardly any institutes for teaching dairy or poultry farming, horticulture or veterinary science.

Botanical research was stimulated by the establishment of teaching and research departments in the universities from the 1920s onwards. Indian botanists such as B. Sahani (Lucknow), P. Maheshwari (Delhi), M. O. P. Iyenger (Madras) and others made significant contributions in their fields of research. The introduction of degree courses in zoology in several Indian universities in the 1920s helped in imparting training in the subject. The establishment of the Zoological Survey of India in 1916 led to the development of animal studies. A bacteriology laboratory established in 1889 in Pune was transferred to Mukteshwar in 1893 and a branch was opened in Izatnagar, Bareilly, in 1913 known as the Imperial Veterinary Institute.

In 1934, the Industrial Intelligence and Research Bureau was started, with its administrative wing in Simla and the research wing at the Alipur Test House in Calcutta. Its object was to make a 'beginning and to lay the foundation on which a research organization suitable for the needs of the country could later be constructed.' An Industrial Research Council was set up by the government to advise on measures for the co-ordination and development of industrial research. The outbreak of the Second World War made officials in London and New Delhi once again realize the importance of harnessing the potential of modern science and technology for the war. The decade preceding independence, with the intervention of the war, saw science, scientific organizations and training applied to meet specific needs. During this period there were some 20 universities, 500 arts and science colleges and 140 colleges of professional and technical education. Eight universities offered postgraduate courses in different branches of science, and 38 engineering institutions imparted training to nearly 3,000 students annually. The total number of scientific societies was around 60. The annual average turnout of postgraduate science students was 900, and of engineering graduates over 1,000. By 1947 there were nine Indian Fellows of the Royal Society of London and one Nobel Laureate. In order to develop the technical know-how and skill of the Indians, technical courses were encouraged and efforts made to organize technical education. For this purpose, an Association of Principals of Technical Institutes was formed in 1941, which was followed in 1945 by the constitution of an All India Council of Technical Education. A Scientific Terminology Committee presented its report in the same year. A Scientific Advisory Committee was created under the Department of Health. Similar boards and research committees were formed in the provinces and princely states. Official and non-official conferences and symposia were organized to discuss the country's needs, such as post-war organization of scientific and industrial research.

Western education in colonial India remained concentrated in and around cities where English medium schools and colleges were established. Though English education was in theory available to all, its spread was extremely uneven. Some regions were more advanced than others. There were differences even within a region between one district or group and another. Everywhere it was more advanced among men than women, in cities than in villages and among the higher castes. It would have been almost impossible to find a scheduled caste girl studying in an English medium school or college before 1947. Thus there were serious inequities in the colonial system of education.

The study of English brought about an intellectual revolution. The organization of the democratic state, its secular character, the structure of its institutions, and the principles underlying them, are all largely European in inspiration. Similarly the social reforms in Hindu society, the movements for the emancipation of women and for the removal of untouchability reflect Western influence to a considerable extent. The English educated intelligentsia imbibed new ideas such as liberty of thought and expression, responsible and objective criticism, tolerance of different opinions, government by discussion and the importance of the individual. But these ideas did not filter down to the masses. Traditional Indian society was hierarchical, and higher education in pre-colonial India had been largely the privilege of the upper castes and classes. These very groups took to Western education initially, which led to a widening of the gulf between them and the masses.

The negative alienating effects of English education are fairly obvious. The education system, by building up an educational elite and neglecting popular education, helped to preserve and strengthen the barrier between the upper classes and the masses. The use of English raised the class/caste barrier even higher. The low rate of literacy, the method of teaching, contempt for manual work, emphasis on literary education and neglect of technical and scientific education – all these constituted formidable obstacles in the path of development. The precise pattern of 'learning from the West' depended on the degree of political independence. In Japan modernizing efforts were first made in the army, administration and economic life. It is tempting to speculate what kind of Western learning India would have borrowed had she had the freedom to choose.

## POST INDEPENDENCE – THE NEHRU ERA, 1947–1964

Independent India inherited a system of education that had been established under colonial rule. It was not only quantitatively small but also qualitatively unsuited to the task of building a self-reliant and growth-oriented economy and a forward-looking society. The need for a literate workforce was regarded as essential in this context, to provide an adequate pool of highly skilled employees. Emphasis was placed not only on rapid expansion of primary education but also on simultaneously strengthening higher education as a whole and particularly technical and scientific education.

The Government of India consequently took various measures to promote scientific and technical education. The University Education Commission (1948–49) recommended that 'as a general part of education for living every step of education from primary school to the completion of undergraduate university work should include teaching of science.' The Secondary Education Commission (1953) suggested a 'General Science Course' for schools. The aim of this was not to produce scientists but to give a basic understanding and appreciation of scientific phenomena. In March 1958, Nehru moved in Parliament to pass the Scientific Policy Resolution. The aims of this policy were among others, 'to foster, promote and sustain, by all appropriate means, the cultivation of science and scientific research in all its aspects, pure, applied and educational; to ensure an adequate supply, within the country, of research scientists of the highest quality … to secure for the people of the country all the benefits that can accrue from the acquisition and application of scientific knowledge.' Soon after Nehru became Prime Minister, he created a ministry of scientific research and natural resources.

Since independence, higher education has expanded enormously. In 1947, India had 20 universities. By 1964/1965 there were 62. During the same period, the number of engineering and medical colleges as well as of polytechnics also increased substantially. By the end of 1965/1966, admission to technical education reached nearly 24,000 for degree and 50,000 for diploma courses. A six- to eight-fold increase in a period of 15 years was quite remarkable. But it was difficult to find employment for these large numbers of graduate engineers and diploma technicians. As a result, after the 1970s, enrolment in science courses started declining. Sadly, there was also a very low enrolment in the veterinary and agricultural colleges. The Council of Scientific and Industrial Research (CSIR) established a chain of national laboratories in a wide variety of fields – chemistry, physics, glass and ceramics, aeronautics, etc. It also set up six regional laboratories. The Indian Council of Agricultural Research was the premier body for sponsoring and co-ordinating agricultural research, as was the Indian Council of Medical Research for medicine. The Tata Institute of Fundamental Research, Mumbai, and the Indian Institute of Science, Bangalore, were the leading institutions for scientific research.

The All India Council of Technical Education, set up in 1945 on the advice of the Central Board of Secondary Education, had recommended the establishment of a number of Higher Institutes of Technology. The first of the Indian Institutes of Technology (IIT) was set up in Kharagpur in West Bengal (1951), followed by Bombay (1957), Madras (1959), Kanpur (1960) and Delhi (1961). They concentrated on postgraduate teaching and research. The IITs soon gained great international prestige and many of their brightest graduates went abroad for research and found employment in foreign universities or research institutes. The establishment of the IITs and National Laboratories drew away talent from the universities, where scientific research started to decline.

In the Five Year Plans, programmes for the development of technical and scientific education were emphasized. In the Second Plan a provision of Rs. 500 million was made for this as against Rs. 230 million in the First Plan. New engineering colleges and polytechnics were established, including many in the private sector, a new phenomenon.

Several of the new national and regional laboratories and institutes were lavishly planned regarding buildings and sometimes equipment but often lacked high-calibre teachers or researchers. There were not enough diploma-level institutes. As a result, whereas India boasts of having the seventh-largest pool of technically trained people in the world, it does not have enough technically trained persons with low-level skills, and the high rate of illiteracy is a contributing factor.

During the process of drafting the Constitution, much time and energy were devoted to the language question. There was naturally a demand that English, associated as it was with foreign rule, could not be retained as the national language. At the same time, it was realized that Hindi was neither sufficiently developed nor sufficiently widespread to become the national language. Hence a compromise formula was evolved: all major Indian languages were given equal status as 'national languages'. Hindi was made the 'official language' for all India purposes; English was to continue as the 'official language' for 15 years from the time the Constitution took effect. The Official Language Commission was appointed in June 1955 to study the progress achieved so far and recommend a timetable for the changeover to Hindi in ten years' time. The Commission observed how, during British rule, English had gradually superseded the Indian languages in the work, activities and thought processes of the higher intelligentsia of all linguistic regions and in the course of time become the sole means of communication at the all India level, or the lingua franca of all persons holding positions of authority or prominence in public life. 'With a rich and well developed language like English at hand, the official language of governance, the medium of instruction for all advanced education and also the language of the learned professions, the Indian languages naturally failed to develop a sufficiently rich and precise vocabulary for the requirements of modern social life.' Despite all this, the Commission felt that English could not be the common language as only about 1 per cent of the population could speak it. The Parliamentary Committee, which examined the Official Language Commission Report, recommended that the changeover to Hindi should take place by 1965, but added that English might continue for any period and purpose laid down by Parliament.

The publication of the Official Language Commission Report in 1957 led to acute differences of opinion on the language question, particularly in the southern states of India, where educationists, people of letters and scientists demanded an explicit commitment that English would continue as the official language. Linguistic riots and popular protest in the southern states led Jawaharlal Nehru to make a formal pronouncement in Parliament in August 1959 that English would continue as an 'additional official language' as long as people required it and that there would be no imposition of Hindi on non-Hindi speaking people. Under the Official Language Act of 1963, English was adopted as an associate official language without any time limit.

Since Independence, the medium of instruction at the primary, secondary and tertiary level in a majority of institutions has changed over to the regional language or Hindi. This has naturally led to a fall in the standards of English. But the popularity and demand for English continues to grow, as the knowledge of the language is the door for admission to institutions of excellence and to

employment. All professional colleges and institutions of national importance such as the Indian Institutes of Technology, Indian Institutes of Management, All India Institutes of Medical Sciences, etc., continue to have English as the medium of instruction. Privately managed 'quality' institutions, usually located in cities, also teach in English, and pupils from such schools take away the lion's share of seats in the prestigious courses in engineering, medicine and management. English is the language used in day-to-day business in private firms, banks, insurance companies, and multinational corporations as well as in government offices.

Consequently, there are two classes of educated people in India – those educated in English and those educated through the medium of the mother tongue/regional language or Hindi. The former constitute a privileged class, which is closer to all decision-making positions, while the latter occupy a subordinate position. This dual system of education has perpetrated and consolidated the position of the English-educated elite. The major share of the world's knowledge, particularly scientific knowledge, is produced in the West, and English is the chief language for the communication and dissemination of this knowledge. Hence English still continues to dominate the life of the intelligentsia. In this sense, Indian education has not broken free of colonial bondage. Macaulay's influence continues. But instead of bemoaning this and crying for a radical restructuring of the education system, better to alter the content of courses and curricula at all levels, as already done to a large extent, and to make them more Indian- and Asian- oriented. Basic books have to be translated into Indian languages. Too much emphasis on Western thought and English language can retard self-reliant thought and work, too little of it may lead to intellectual isolation.

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# 36.2

## SCIENTIFIC PRACTICES IN INDIA
## BEFORE INDEPENDENCE

*Kapil Raj*

Although the inhabitants of the Indian subcontinent have possessed distinctive scientific and technological traditions for over two millennia, they had little trouble in becoming part of the emerging institutions of international science and technology during the latter half of the nineteenth century. Indeed, Indians today represent the third-largest national community of researchers. Already in the early decades of the twentieth century, the productive Indian community of researchers counted among its members, apart from a Nobel Prize in physics, many distinguished fellows of the most prestigious international scientific and technological societies. In the present article we shall examine the evolution of traditional scientific practices in the wake of this massive shift from one context of production, validation and circulation of knowledge to another. However it would be instructive to preface our remarks with some observations on the nature of 'traditional' science in South Asia.

One of the most noteworthy aspects of traditional science in South Asia is the manner in which knowledge was hierarchically organized in the classical Hindu tradition: contemplative and other forms (e.g. linguistics, astronomy, mathematics and, later, astrology) concerning ritual practices being situated at the apex. These forms of knowledge, the preserve of higher castes, were held in greater esteem than practical know-how (e.g. pottery, carpentry, spinning, weaving, metallurgy, alchemy, irrigation technology, etc.) relating to material needs. Some of the 'higher' forms of knowledge – grammar, phonetics, etymology, metric and permutations and combinations in mathematics – arose within the Vedic schools as a necessary condition for mastering, communicating and expounding the Vedas (together with all of the most prestigious Brahminical works), laconically composed in strict metre in Sanskrit, a language conceived and meticulously developed for oral transmission. An erroneous recitation of the Vedas was considered not only a fault but also a catastrophe for the ritual in question. Other disciplines, such as astronomy and mathematics, have served to determine the time and location of rituals and other practical purposes. Writing, although it has existed in the Indian subcontinent for over two millennia, was considered to be a technical skill rather than a culture medium or learning tool.[1] Thus, there developed alongside

the aforementioned disciplines, a set of mnemotechnics through which priests could memorize the vast Vedic corpus by isolating words independently of their meaning and inverting the normal order of words, verses, and speech combinations; and each of these complex recitation techniques in this learning process is designated by a specific expression.[2] All these disciplines, linguistic as well as mathematical, and the accompanying mnemotechnics were elaborated in Sanskrit and traditionally considered to be appendices of the Vedas in order to ensure their preservation, transmission and continued use. This enormous corpus of knowledge was transmitted through rigorous formal instruction that lasted at least twelve years.[3]

Practical *savoir-faire* was also generally transmitted orally but in local, vernacular tongues within each of the (lower) caste groups, most often within the family unit or sometimes through the centralized professional guilds. Meaning literally 'the language of the cultivated', Sanskrit was the closely guarded prerogative of the Brahmin castes.[4] This, of course, is not to say that a standardized intellectual language imposed uniform knowledge and practices. Quite to the contrary, intellectual practices were conceived of within the framework of a variety of philosophical and cosmological traditions that varied from region to region and over time: like other cultural practices, those related to knowledge were not fixed. They varied according to the religious and philosophical leanings of the patrons – princely courts, powerful families – or to the specificities of the groups of practitioners.

The establishment of Islam as a major religious and cultural force in South Asia from the beginning of the second millennium added to the complexity of the institutional basis of scientific practice in the region, not least by disturbing the relationship between orality and writing. Indeed, by the mid-eighteenth century written media were being used in complex and creative ways to complement and reinforce oral culture in both Hindu and Islamic communities. In addition, Islam brought with it a series of knowledge practices in fields as varied as mathematics, astronomy, geography, map-making, surveying, instrument-making and medicine. These fields of expertise interacted, in many cases, with those of the

subcontinent, giving rise to hybrid forms of specialized practice, for instance the Hindus' use of the astrolabe for astronomical computations within the framework of Hindu astronomy and astrology. However, in areas untouched or less affected by Islam, knowledge practices followed other evolutionary patterns, changing for example because of endogenous pressures. Keeping in mind the immensity of the subcontinent and the diversity of histories of its regions, what can be called 'traditional' knowledge in India, far from being static in nature, thus covered many different sorts of specialized practices each within a specific historical context.

The advent of British rule introduced yet other changes to scientific and technical practices in the subcontinent. The fundamental unity, claimed by Sir William Jones and other officials of the East India Company in the late eighteenth century, between classical Sanskrit, Latin and Greek and the cultures in which they circulated, has been widely acclaimed as the beginning of scientific linguistics and comparative philology. This 'Orientalist' movement in British intellectual history had a considerable, albeit unintended, consequence: Hindu elites acquired a new sense of pride through a reinforced consciousness of their past.[5] Through the revival of Orientalism, this glorious Hindu past was equated with ancient Greece and Rome, the reputed cradle of European civilization and science. Orientalists held that classical Indian civilization had declined just like the civilizations of classical Greece and Rome.

With their reawakened self-awareness, the Hindu elites thus began wilfully to reinstate their long lost past by revitalizing the methods of contemporary European science. Thus, in 1817 they established the Hindu College in Calcutta (later to become today's Presidency College) without any assistance from the government in order to cultivate English literature and European science. And when the British opened the Sanskrit College in Calcutta in 1824 to teach Bengali children Sanskrit, rhetoric, sacred literature, law and grammar, the Hindu elites pleaded for the instruction of European sciences, forcing the school to introduce into its curriculum mechanics, hydrostatics, optics, astronomy, mathematics, anatomy and medicine – all in English. The resulting programme was a fusion of traditional Sanskritic studies of rhetoric, sacred literature, law and grammar with Western literature and science. Almost half of its students opted to study these disciplines, even though they were not required subjects.[6] Meanwhile, the Calcutta School Book Society edited mathematics and science manuals based on traditional pedagogy.[7] This hybridizing trend was to continue throughout the nineteenth century and was indeed institutionalized through the establishment of the first three universities at Calcutta, Bombay and Madras in 1857. Following close on their heels, came the *Calcutta Journal of Medicine* (1868) and the Indian Association for the Cultivation of Science (1876), both founded by a Calcutta-educated physician, Dr. Mahendralal Sircar. At the turn of the century, the University College of Science, also at Calcutta, with Chairs reserved for Indian scientists in, among other subjects, physics and chemistry, was founded by Sir Asutosh Mookerjee, amateur mathematician, High Court judge, active member of the Asiatic Society of Bengal and later Vice-Chancellor of the University of Calcutta. Soon after their creation, these universities and institutions were to

achieve distinction in world-class science by fostering pioneers like Jagadis Chunder Bose, Prafulla Chandra Ray, Chandrasekhara Venkata Raman, Satyendranath Bose, Megnad Saha and Homi Jehangir Bhabha, to name but a few. Although many Indians got assimilated into the mainstream of international scientific and technological practice, an appreciable number also sought to revalorize traditional Indian scientific learning and practices. Their approaches to problems and their expression of solutions are clearly structured by this hybrid tradition. Mahendralal Sircar, for instance, held that European medical theory and practice were not in any *a priori* sense superior to traditional Indian medicine. Thus, although the decline of princely courts under British colonial rule also meant the disappearance of the sponsoring and certifying institutions of traditional science in the Subcontinent and thus of traditional science, the simultaneous valorization of both traditional Indian and European cultures by many of their founders and later members meant that these new institutions playing such an important role in the development of modern science in India were also the ones which fostered a traditionalist discourse on science: the very same institutions served both to introduce Western science and to reinvent and legitimate traditional science in a sense similar to that developed by Hobsbawm and Ranger.[8] In this way, traditional learning entered a progressive phase – at least that part of traditional learning that sought to incorporate Western intellectual practices and skills within the overall framework of a renewed Hinduism. On the other hand, the production of traditional science that took place outside this new institutional framework, which doubtless continues to this day, was rendered unidentifiable owing to the decline of traditional institutions that guaranteed its certification and publicity.

This idea of a merger of indigenous 'paradigmatic traditions' and Western cognitive and material practices finds concrete expression in the praxis of these scientists who, while being able to communicate perfectly with their Western peers and colleagues, used traditional cosmologies and skills of the subcontinent as resources both in problem choice and in ways of going about their problem-solving.[9] In the remainder of this section, we shall try and illustrate this phenomenon through an account of the lives and works of two distinguished Indian scientists and Fellows of the Royal Society: Jagadis Chunder Bose and Srinivasa Ramanujan.

Jagadis Chunder Bose, the son of a deputy magistrate, entrepreneur and amateur physicist, biologist and engineer, was born in 1858 in what is now Bangladesh. His family, of Kayastha origin, had converted to Brahmaism although his mother continued to adhere to the dominant Shakti cult.[10] After an initial education at a village school, Jagadis Chunder studied Sanskrit, Latin and physics with Father Eugène Lafont at St. Xavier's College, Calcutta. Upon graduation in 1879, he travelled to England with the intention of studying medicine, but with a scholarship and some encouragement by Lord Rayleigh, he transferred to Cambridge University and graduated in natural science in 1884. Bose returned to India and was immediately appointed professor of physics at Presidency College, Calcutta, where he remained until his retirement in 1915. A very able instrument maker, he gained international recognition early in his career through the generation, reception and optical properties of electromagnetic radiation in certain unexplored wavelengths. A few years later, Jagadis Chunder anticipated

Marconi's commercially exploitable wireless-transmission experiments by demonstrating for the first time the feasibility of the wireless transmission of electromagnetic signals in Calcutta and at the Royal Institution in London. He also gained recognition by elaborating a general theory of the properties of contact-sensitive substances in the field of what has now come to be known as solid-state physics. In recognition of his work the University of London awarded him a D.Sc. in 1896. However, from around 1900, Bose's religious and philosophical beliefs led him to study the similarities between the absorptive responses of inorganic and biological matter to centimetre-wavelength radiation and to various stimuli, a study that occupied him until his death in 1937. He published at least ten books on the subject.[11] 'Life takes form,' he wrote, 'due to the power struggle between the inner and the outer. At the source of both the outer and the inner lies the same *Mahashakti* who powers the nonliving and the living, and the atom and the universe.'[12] It is not surprising that this aspect of his work was not accepted by his peers and colleagues: 'In 1901 and 1904', writes Charles Süsskind, 'his papers were rejected by the Royal Society, partly because of the philosophical terms in which they were couched.'[13] Society members continued, however, to admire the extremely sensitive automatic recorders he devised to measure plant growth. He was knighted in 1917 and elected a fellow of the Royal Society in 1920. There is no doubt that Bose was conscious of the example he was setting as a leader in the resurgence of Indian – particularly Bengali – culture. For, on retirement from Presidency College in 1915, he founded the Bose Institute in order to 'further investigat[e] … the many and ever opening problems of the nascent science which includes both Life and Non-life.'[14]

Srinivasa Ramanujan was born in Erode in Madras State (present-day Tamil Nadu) in 1887 in a Vaishnavite Brahmin family.[15] He was brought up in Kumbakonam, where his father eked out a meagre existence as a bookkeeper to a cloth merchant. However, the family's poverty did not stop them from educating the young Ramanujan. At home, he was brought up within an orthodox Tamilian Vaishnavite tradition, a staunch devotee of Vishnu's consort and principal goddess of Kumbakonam, Lakshmi Namagiri. His mother, an adept of astrology, numerology and traditional board games, transmitted her paramathematical sensitivities to her son, who also developed an interest in the sayings of saints, the *Puranas* and other Sanskrit classics, all of which he frequently recited in traditional Brahminical style. By the age of ten Ramanujan had passed his primary school examinations in English, Tamil, arithmetic and geography, standing first in the district. At high school in Kumbakonam, he was already fascinated with the notion of zero, challenging his teachers, whom he had surpassed in mathematical knowledge, and was soon helping his fellow students in mathematics. But his real enthusiasm for mathematics arose in 1903, just before he left high school, when some college students staying with Ramanujan's family gave him a mathematics cram book to prepare students for the notoriously difficult Cambridge Tripos – the first volume of G. S. Carr's *Synopsis of Elementary Results in Pure and Applied Mathematics*.[16] As the title suggests, this was not a mathematics textbook but rather a progressive compilation of some five thousand equations, theorems, formulae, and geometric diagrams, all arranged by topic. Apart from the thrill of discovering the relationship between concepts and equations that the book suggested, Ramanujan also found its style particularly seductive, which corresponded to that of classical Sanskrit texts – a highly condensed sentence, or *Shruti*, sometimes accompanied by a commentary or *Bhasya*, but never a proof. From then on, and at the expense of his academic and professional career, he was to style his mathematics on this book, filling out two notebooks with a host of new theorems and commentaries in pure mathematics, inspired in part by what he read in Carr, but never a proof in the sense accepted by the contemporary mathematics community. Indeed, although in the years ahead Ramanujan found a number of sympathetic ears among professional mathematicians in India, no one was capable of evaluating his work because of its non-conformity. It was left to Godfrey Harold Hardy, a well-known but eccentric Cambridge pure mathematician to whom Ramanujan had been asked to write when all other peer evaluation had failed, to risk a positive judgement of his work and to invite him to spend some years in Cambridge. A unique collaboration and entente developed between the two men during the four years that Ramanujan spent with Hardy at Cambridge. During this period, Hardy put some of what he judged as Ramanujan's most important theorems into a language and conventions understandable by the modern mathematical community thereby rendering him one of this century's most prodigious mathematicians. Although Ramanujan died in 1920 of tuberculosis, which he had most probably contracted during his stay in England, his notebooks are still a source of inspiration for researchers in fields as distant as particle physics, metallurgy, crystallography, telecommunications and cancer research. And, because of their strange unconventional character, they continue to be one of this century's major enigmas.

The foregoing discussion shows the complexity involved in posing apparently simple questions concerning the spread of modern science, questions which take for granted that the successful introduction of scientific ideas or practices necessarily involves the renunciation of older knowledge practices or at least their relegation to the sphere of the traditional. Indeed, in concert with the Kuhnian theory of paradigm displacement, it is commonly believed that in the face of competing sets of practices, there is one clear winner and one clear loser. And if older knowledge practices do continue to exist, they can in theory be located within a clearly distinguishable group different from that of the practitioners of modern science. Further, if the latter group continues to believe in older knowledge forms, then this clearly shows a shortcoming in their practice. In contrast to 'pure' strands of 'metropolitan' scientific practice, scientific practice in India (and one might say in the non-Western world) can only be 'hybrid', tainted with past practices and replete with compromises with local knowledge traditions. And while they might accord a certain status to their practitioners within their own societies, they are certainly peripheral to international science.

Contrary to this perspective, I have tried here to show that older practices can be, and are, fruitfully incorporated into contemporary scientific practice. Moreover, the practitioners of this 'hybrid' science, far from being relegated to an insignificant periphery, are considered to be very much part of the scientific centre. Beyond pointing to the habitual and often artificial cleavages that historians seek to draw between a dynamic Western intellectual tradition, of which modern science is considered the spearhead, and static

forms of knowledge practised elsewhere in the world, it is hoped that this essay goes some way in blurring the boundaries between tradition and modernity as much as between centre and periphery.

## NOTES

1.    See C. Malamoud, 'Parole à voir et à entendre', *Cahiers de littérature orale*, Vol. 21, 1987, pp. 151–61.

2.    C. Malamoud, 'Hiérarchie et technique. Observations sur l'écrit et l'oral dans l'Inde Brâhmanique', in P. Achard, M-P. Greunais, D. Jaulin, (eds), *Histoire et linguistique*, Paris, 1984, pp. 115–22. See also G. Thibaut, 'On the Sulva-sutras,' *Journal of the Asiatic Society of Bengal*, 1875, pp. 227–75; reprinted in D. Chattopadhyaya (ed.), *Studies in the History of Science in India*, New Delhi, 1982, pp. 415–78.

3.    See R. K. Mookerji, 'Glimpses of Education in Ancient India', *Annals of the Bhandarkar Institute*, Vol. 25; 1944; idem, *Ancient Indian Education*, London, 1947; and S. K. Das, *The Educational System of the Ancient Hindus*, Calcutta, 1930.

4.    Cf. D. D. Kosambi, *An Introduction to the Study of Indian History*, Bombay, 1956, pp. 260 ff.

5.    See W. Jones, 'The Third Anniversary Discourse: On the Hindus' *Asitack Researches*, Vol. I, 1788, pp. 343–55; and N. B. Halhed, *A Grammar of the Bengal Language*, Hoogly, 1778. See also R. Rocher, 'British Orientalism in the Eighteenth Century: The Dialectics of Knowledge and Government' in C. A. Breckenridge and P. van der Veer, (eds), *Orientalism and the Postcolonial Predicament*, Philadelphia, 1993, pp. 215–49; and K. Raj, 'La compagnie des Indes: du commerce à la linguistique' *La Recherche*, No. 300, July-August 1997, pp. 46–49.

6.    See K. Raj, 'Hermeneutics and Cross-Cultural Communication in Science: The Reception of Western Science in 19th-century India', *Revue de Synthèse*, IVᵉ série, Vol. 1–2, 1986, pp. 107–20

7.    A remarkable example is that of an arithmetic textbook – Reverend May's *Gonito* – which was an attempt to give to the Indians their own arithmetic in printed form. It was noticed and accepted, strangely enough for rationalists of today, that the Indians had a system of arithmetic of their own. Speaking about these years in his evidence before the House of Lords, Horace Hayman Wilson, Boden Professor of Sanskrit at Oxford and erstwhile functionary of the East India Company in India, expressed this quite clearly when, in answer to a question about the use of the 'head' by Indians in calculating, he told his interrogators that they did indeed 'Very much; in fact their process is objectionable on that account; although they [the Indians] write down the different operations on a slate, they rub out the process, and give nothing but the results.…They have a process; but if you tell them to show you how they come to the conclusion, there is nothing but the conclusion to be seen; they have rubbed out everything but the result, and you have nothing before you to show their mode of going to work.' [Evidence of H. H. Wilson before the Select Committee of the House of Lords, 5 July 1853, in The *Second Report from the Select Committee of the House of Lords Appointed to inquire into the Operation of the Act 3 & 4 Will. 4, c. 85, for the better Government of Her Majesty's INDIAN TERRITORIES; … Minutes of Evidence, Session 1852–3*, London, 1853, p. 261]. It is reported that Reverend May's *Gonito* was largely preferred to another widely available work published by the Society – Harle's *Arithmetic* – which was based upon the 'European' model. Indeed, so popular was the book that the first edition of 500 was exhausted in a few months and the Secretary of the School Book Society regretted that so few had been printed, for 'even if 5,000 copies had been printed, the whole would have found ready outlets of distribution, [*Second Report of the Calcutta School Book Society*, Calcutta, 1821, Appendix X. Quoted in N. L. Basak, 'Origin and Role of the Calcutta School Book Society in Promoting the Cause of Education in India, especially Vernacular Education in Bengal (1817–1835)', *Bengal: Past and Present*, Vol. LXXVIII, January, 1959, pp. 30–69. See also T. Fisher, 'Memoir on Education of Indians', Appendix I of the *Report from the Select Committee of the House of Lords on the Affairs of the East India Company on the Renewal of the Charter, 1831–32*, London, 1833, pp. 194–348; reprinted in *Bengal: Past and Present*, Vol. XVIII, Jan.–June, 1919, pp. 73–156].

8.    See E. Hobsbawm and T. Ranger (eds), *The Invention of Tradition*, Cambridge, 1988.

9.    I have borrowed the expression 'paradigmatic traditions' from G. W. Stocking, Jr. See his 'Paradigmatic Traditions in the History of Anthropology' in *The Ethnographer's Magic and Other Essays in the History of Anthropology*, Madison, WI, 1992, pp. 342–61.

10.    For more complete biographical information on J. C. Bose, see P. Geddes, *The Life and Work of Sir Jagadis C. Bose*, London, 1920; C. Süsskind, 'Jagadis Chunder Bose', in *Dictionary of Scientific Biography*, Vol. 2, New York, 1975, p. 325.

11.    Among others, *Response in the Living and Non-living*, London, 1902, and *Plant Autographs and their Revelations*, London, 1927.

12.    *J. C. Bose*, Abyakto (ed.), P. B. Sen, Calcutta, 1958, pp. 191–94.

13.    C. Süsskind, op. cit.

14.    Quoted in D. M. Bose, S. N. Sen and B. V. Subbarayappa (eds), *A Concise History of Science in India*, New Delhi, 1971, p. 558.

15.    There is no dearth of biographical material on Ramanujan, one of the most mystifying personalities of our time. Among the more reliable ones, see G. H. Hardy, *Ramanujan – Twelve Lectures Suggested by his Life and Work*, Cambridge, 1940; E. H. Neville, 'The Late Srinivasa Ramanujan', *Nature*, Vol. 106, 1920, pp. 661–62; S. R. Ranganathan, *Ramanujan, the Man and the Mathematician*, Bombay, 1967; S. Ramaseshan, 'Srinivasa Ramanujan', in *Proceedings of the Ramanujan Centennial International Conference, 15–18 December, 1987*, pp. 1–14; and R. Kanigel, *The Man Who Knew Infinity*, New York, 1991.

16.    G. S. Carr, *A Synopsis of Elementary Results in Pure and Applied Mathematics*, London, 1880.

# 36.3
## COLONIALISM, NATIONALISM AND
## THE INSTITUTIONALIZATION OF SCIENCE IN INDIA

*Dhruv Raina* and *Syed Irfan Habib*

## MODELS OF TRANSMISSION

A comprehensive appreciation of the institutionalization of modern science in late nineteenth and early twentieth century India, then under British rule, requires that we recognize the diversity of theories concerning transmission of knowledge. The most significant one is that of the centre-periphery,[1] inspired in part by its analogue in economic theory, though there are radical points of departure. While the model presumes that science is a cultural universal, a problematic outcome of this assumption is that the process of the reception of science at the periphery, despite the social character of science, does not attenuate the practices of the science or the core values it possesses at the centre from where it diffuses.[2]

This theory serves as the point of departure for the present account of the institutionalization of science in India. This could be instantiated through the collegial ties, collaboration and apprenticeship of some of India's leading scientists, who spearheaded the process of institutionalization in India, with their counterparts in Europe.

Biography is a genre at the periphery in the history of science, for it shares a great deal with its counterpart in the West, for in both cases leading scientists and the processes they initiate or the theories they invent are framed within a myth of origin, from where the history of science then blossoms. In the peculiar case of the Indian scientist at the periphery of science in the late nineteenth century, the absence or underdevelopment of collegiality and institutional structures at the periphery draws biographers into portraying these scientists as exiles astride two worlds. As nowhere men, since women were few and far between at the time, the scientist at the periphery is portrayed as constrained by the lack of vision of his countrymen, and as an exotic specimen by colonial administrators. Such origin myths confer on the enterprise a sagacious beginning and in the process legitimate the identity of science.[3] To further our understanding of the process of the institutionalization of science in India during this period, we draw upon three intersecting frames. First, there is the larger process of the globalization of the sciences.[4] This in turn relates to the struggle of Indian scientists to gain entry into the world of science, and the constraints and opportunities offered by British rule in providing access to the invisible colleges of science at the centre. The final frame relates to the nationalist struggle and the impetus it provided to the institutionalization of science in India, in that specific context.

Towards the end of the nineteenth century and the first decades of the twentieth, India was at the periphery of modern science and aspiring to catch up rapidly with the centres in Germany, England and France. In this variegated cognitive, political and epistemological field, political and cultural considerations often moderated the acceptance of scientific claims made by the practitioners of science at the periphery. At the epistemological level, experience showed that scientific claims emanating from the periphery were most likely to be recognized once the scientists from the periphery gained entry into the invisible colleges that operated at the centre. While collegial ties and exchanges could be forged across social and geographic distances, successive encounters between a number of scientists also reveal much about the ways that the global political framework shaped their ability to participate in science.[5]

## THE FORCES SHAPING THE INSTITUTIONALIZATION OF SCIENCE

Modern science in India dates back to the age of exploration, first through the efforts of European missionaries and travellers, and later through trained scientists and bureaucrats employed by the East India Company to survey the colonies both for mineral and plant resources, as well as the topography of this vast subcontinent.[6] It coincided with the consolidation of the field around European centres. With the onset of the process of colonization this exploratory impulse led to the first institutionalization of science in India. The period from 1761 to 1903 was known as the Age of the Great Surveys, for the Empire's boundaries and resources were mapped during this time. Societies like the Geological Survey of India and the Trigonometric Survey were founded by the British to extend their dominion over

the country, as has been scrupulously detailed in Edney's carefully documented work.[7] There exists a great divergence and diversity of interpretation over the expropriative nature of colonialism itself, and whether or not this truly set the stage for the institutionalization of modern science in India. But generally, the colonial institutes founded by the British were seen as the primary conduits for disseminating modern science and scientific research throughout the subcontinent. There is unanimity among historians that the institutionalization initiated by the British endowed their rule with the symbols of imperial power, and the tools to manage, exploit and control their empire.

The absence of sovereignty in decision-making differentiates the Indian case from nations like China and Japan on the one hand, and settler societies such as Australia and Canada on the other. By the end of the nineteenth century Victorian India was endowed with a few 'teaching universities' and a low form of scientific and technical education administered under controlled conditions. Fundamental research was not included in the charter of the universities during this period, nor was it on the agenda of other imperial research institutes save for astronomy.[8] Until 1890 whatever research there was was undertaken largely through government departments or was monitored by them, and in turn complemented by the field surveys undertaken by the societies and/or military organizations. Without committing the error of an earlier generation of historians of science, who construed these surveys as a lower order scientific activity that in turn validated the centre-periphery model, We would emphasize that the surveyors often wore many hats and played a significant role in stabilizing the image and practice of Baconian science. What remains true of the older picture is that economic considerations weighed heavily in colonial decisions about the priority areas of scientific research. This prompted S. N. Sen, the historian of science, to ask why scientific progress in India came so late in the nineteenth century, despite the incredibly rapid expansion of European science and imperialism. Sen argues that the Imperial government accorded priority to such 'field sciences' as geology, botany, astronomy and cartography, which directly served the colonial agenda.[9] However, it must not be forgotten that the colony was a laboratory for a great scientific experiment that played a significant role in the colonial capitalist state. The colonial state was innovative in founding formal technical institutions that were replicated in England, thereby nourishing the technical development of education in England.[10] In a very important way, then, the colony provided the prototype for the subsequent framing of the state-supported science model in Great Britain.

The second stage in the institutionalization of science in modern India followed three-quarters of a century after the founding of the Asiatic Society in 1784, when the universities were established, first in the Presidency towns of Calcutta, Bombay and Madras in 1857, when followed by Punjab University, Lahore, now in Pakistan, in 1882, and Allahabad University in 1887. By 1900, there were 170 colleges, 4 colleges of medicine, 4 colleges of engineering, 28 medical schools, and 12 engineering schools. This major pedagogic endeavour should not be seen as a sign of the institutionalization of science, but the universities were producing knowledge and providing the battleground where the subsequent destiny of the scientific research system in India was fought. In the background the example of the

German university had inspired many a European nation and the United States. However, the universities in the Presidency towns developed in 1857 as teaching institutes and examining bodies. The intent was to produce Indians, true to Macaulayan diktat, in skin and colour but educated in English on the Western model, in order to train efficient government clerks to help run the empire. Postgraduate teaching and research was not part of the charter of these universities. It took fifty years of struggle by the Bhadralok community in Calcutta for the University Charter Act of 1904 to be enacted, permitting Indian universities to proceed with postgraduate teaching and research.[11]

This effort was preceded by the founding of the Indian Association for the Cultivation of Sciences, in Calcutta in 1876, and inspired by the British Association for the Advancement of Sciences. The IACS as it came to be called was a society supported by the native gentry, whose goal was to organize a modern scientific research system under 'native management' and directed on national lines. The first years were dedicated to organizing lectures in the sciences, popularizing science and gradually supporting small scientific research projects. The laboratories of the IACS provided institutional space for the early efforts of many of India's important scientists. On the other hand, the Indian Institute of Science, Bangalore, was not created through the efforts of a highly educated professional middle class, seeking funding for their efforts from the rural gentry (land-owning class) of Bengal, but emerged as an idea of a leading Indian industrialist, Jamsetji N. Tata. Tata, like his compatriots in Bengal, was dissatisfied with state of India's teaching universities (a euphemism for examining bodies), and proposed setting up a real university that he referred to as the Research Institute of Science and was later christened the Indian Institute of Science. The institute was founded through an endowment of his own, support from the Princely state of Mysore, and after years of struggle, with matching support from the Government of India in 1905. Tata had been instrumental in setting up India's first modern textile and steel mills, and was evidently inspired by the Humboldtian model of the university, which combined teaching and research. The institute he conceived would give a 'fresh impulse to learning, to research, to criticism, which will inspire reverence and impart strength and *self-reliance* to future generations of our and your countrymen.'

In addition to the German model, this industrialist was equally attracted by Johns Hopkins University, Baltimore. The historian of science Subbarayappa suggests two possible reasons as to why. The first had to do with its being the first university in the United States founded as a postgraduate institution, which is what Tata's institute turned out to be, a tradition continued today by the Indian Institute of Science.[12] P. C. Ray, the founder of the school of modern chemistry in India, disagreed with Tata's proposal on the ground that an institute where only mature scientists carried out their research would be out of place in India at the end of the nineteenth century. The Indian student still needed to be apprenticed to a researcher at an existing university. These universities needed to be well endowed and widened in scope. Ray's proposal was to build up capabilities from below whereas Tata was suggesting leap-frogging and proceeding with the task of building the new nation.[13] This is not to say that Tata's conception was purely instrumental. On the contrary it was a liberal one. However, as was the case with the National Council of Education in Bengal, the general consensus was

that the scientific and technical subjects should receive priority, with medical investigations next, and philosophical and educational subjects last on the list. In any case the industrialization of scientific research programmes was underway in the minds of those shaping the future of India's scientific institutions. The mood of the nationalist uprising was such that these efforts in university pedagogy were driven by the urgency of acquiring economic sovereignty.

## THE INSTITUTIONALIZATION OF PHYSICS RESEARCH

The institutionalization of the scientific research system that had commenced in the 1870s proved particularly fruitful for the future of modern physics in India. The period between 1890 and 1935 was punctuated by the notable contributions of J. C. Bose, C. V. Raman, M. N. Saha and S. N. Bose. An examination of the bibliometric data indicates that these four physicists dominated the field with their publications and that schools, traditions and networks of physicists grew up around them.[14] Bibliometric data further suggests the emergence of a community of physicists in India as well as the institutionalization of research. In particular, it could be emphasized that the decades between 1910 and 1930 were landmark years. In the nineteenth century, geophysics and geomagnetism were major research areas, undertaken at what is now called the India Institute of Geomagnetism at Colaba in Bombay. Sub-disciplines that included heat and thermodynamics, magnetism and electromagnetism, optics and radiation were also important, and marked by the extraordinary research efforts of individuals such as J. C. Bose, whose paper 'On the polarisation of electromagnetic waves by double refraction' appeared in 1894. The dispute between Marconi and Bose over the discovery of radio waves is now seen by some scholars in another light.[15] Bose may be credited with the production of short wavelength radio waves, in addition to which he was able to put forward a general theory of the properties of contact-sensitive materials. The institutionalization of physics research is further substantiated by the exponential increase in publications between the decades 1900 and 1920. Between 1910 and 1920 the number of publications doubled, and this pattern was sustained until the onset of the Second World War.[16] This quantum leap in the number of publications was reflected across all disciplines, but especially those which had been institutionalized for a hundred years. Consequently, by the 1920s the critical mass of researchers and the output of the group suggested that a school of physics had been instituted in Calcutta. Its members were situated at the Presidency College, Calcutta, and Raman, while a Professor of physics at Calcutta University, continued performing experiments at the Indian Association for the Cultivation of Science. In 1917 Raman transformed the proceedings of the Association for the Cultivation of Sciences into the *Indian Journal of Physics*. The next decade was to prove very fruitful. Raman's path-breaking work on molecular scattering had begun by 1925, Megh Nad Saha had written his most influential papers, which were instrumental in establishing the field of theoretical astrophysics, and Satyendra Nath Bose was to co-author with Einstein one of the papers that closed the quantum theory phase of quantum physics. In a manner of

speaking the community of Indian physicists were now part of the globalized community of physicists, and the gap between centre and periphery was partially bridged. Furthermore, many ideas originating at the periphery were to nourish the evolution of science at the centre itself.[17]

The most noteworthy feature during this period was the decreasing time needed for research produced in the metropolises of science to spread throughout India. During the last few decades of the nineteenth century this lag was about twenty years; by the 1930s it was less than five years. Hence, by the early decades of the twentieth century, the formation of research networks, and the institutionalization of physics research closed the temporal distance separating metropolis from province.[18]

By the time the first generation of Indian physicists had registered their presence in the discipline, two revolutionary developments heralded the golden age of contemporary theoretical physics: the special and general theories of relativity and the quantum revolution. Despite the contributions of Indian physicists, the university system did not create a post for theoretical physics until 1950. Most theoretical physicists functioned within departments of mathematics and applied mathematics, or in physics departments. The absence of political sovereignty constrained the choices available, and the peers of the scientific community had already forged ties, sometimes explicitly, with the nationalist struggle. Even within the Princely State of Mysore, C. V. Raman, by then a Nobel laureate, was unable to negotiate the appointment of Max Born, who was planning to leave Germany, to the department of physics at the Indian Institute of Science. This rebuff was one of many factors responsible for his quitting the Indian Institute of Science two years before he was to retire. He went on to set up the Raman Research Institute using the several awards he had received and additional support he had solicited.[19] The Indian Association for the Cultivation of Science had relatively greater autonomy. But even there no official positions were obtained until 1950. The Indian physicists working in general relativity and cosmology – such as J.V. Narlikar and P. C. Vaidya – carried out their research in departments of mathematics and applied mathematics. Within five years of India achieving independence, Homi Bhabha had established both the Tata Institute of Fundamental Research and the Atomic Energy Establishment Trombay[20] (later BARC); the contingencies of nuclear physics-related research prompted enormous growth in theoretical physics and mathematics.

The history of disciplines such as theoretical physics in India instantiates the case for the emergence of a non-field discipline outside the imperial rubric of science and in turn throws up problems for models of the transmission of modern science such as Basalla's three stage model. In fact, delving into the probable causes of the slow institutionalization of the discipline reveals the environment within which science was introduced in a colonized culture. The barriers to the dissemination of theoretical physics through this 'national', counter-imperial initiative may be identified at a number of levels. In the first instance, there was a paucity of infrastructure and institutions within which the discipline could take root. Consequently, leading theoretical physicists were pre-occupied at the height of their careers with the need to establish institutions for physics research. In cultural terms, the modernizing strain within the nationalist struggle imputed Indian underdevelopment to the disjunction

between theory and practice. During the discipline's formative years in India, namely 1910–35, it is likely that members of this network were not prepared to re-institute what they perceived to be a division of labour within science that could in turn prove detrimental to the performance of scientific research.[21] Thirdly, we must not preclude the importance of individuals and their persona in providing role models for subsequent generations of scientists. C. V. Raman's persona captivated the world of Indian physics. Raman was an experimentalist of outstanding merit, and inspired a whole generation of experimentalists after him.[22] However, his dispute with Born on Lattice Dynamics and subsequent souring of their relationship quite possibly soured his attitude towards all theoretical physicists.

Despite the globalization of science and the networking of Indian scientists with their colleagues in the international community, there remained the difficulties of pursuing science at the periphery. These difficulties were both institutional and a result of lack of opportunities produced by economic underdevelopment in the colonies. Thus, as DeVorkin argues, it was Saha's work that more or less created the discipline of theoretical astrophysics.[23] But this could not be translated into an opportunity for creating a centre that would lead the discipline. While the relative freedom in isolation liberated him from peer pressure and enabled him to tread entirely new pathways, his location at the periphery constrained him from exploiting the potential of his theory. Furthermore, he would have lacked the panoramic overview of the discipline that comes from being located at the centre.

## CONCLUSION

We began this discussion with the models of transmission in the history of science. This was followed by discussion on the forces shaping the institutionalization of science, first by colonialism, and subsequently by national resistance to colonial rule. Finally, we took up the specific case of the institutionalization of physics research in India to illustrate the issues raised. Against this local backdrop we pointed out the larger process of the globalization of science and the construction of an international community of science.

To recapitulate some of the points raised, we emphasized that the decades 1910 to 1930 were crucial for physics research in India on more than one count. The rapid rise in the number of publications during the decade 1910–20 was a spin-off from the University Charter Act of 1904 that empowered universities to undertake postgraduate teaching and research. During this early period, the bulk of research in these sub-disciplines was the product of the effort of a few gifted individuals, around whom schools gradually emerged. Their efforts were the most renowned contributions of a broader community coming to grips with the newly emerging front of knowledge. The older disciplines were highly dependent on the researches undertaken by a few individuals and their teams of researchers. The case was different with the newer disciplines, which benefited from the rapid diffusion of their work through universities and other research institutions.

The desire to inculcate new scientific practices like reporting and communicating research results found expression in the attempts by leading Indian scientists to switch publication to Indian journals in order to promote the development of physics research in India. They were partly influenced by emergent nationalist concerns, but this happened only after they had registered their presence in the international community of science. The first three decades of the twentieth century constitute a landmark in the institutionalization of physics research in India, wherein significant research and discoveries of front-running physicists was emblematic of a much broader process. Between the end of 1920 and the end of 1930 there was a 400 per cent increase in the number of scientific authors, and an almost 250 per cent increase between 1930 and 1940. A substantial community of physicists was beginning to appear, due to the forging of collegial ties, creation of networks and the institutionalization of physics research, as the distance separating metropolis from province was nearly closed.

## NOTES

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# 36.4

## THE NATIONAL MOVEMENT IN INDIA AND THE FOUNDATIONS OF SCIENTIFIC AND INDUSTRIAL RESEARCH

*Dhruv Raina* and *Syed Irfan Habib*

### INTRODUCTION

As suggested earlier, the transmission of modern scientific knowledge to India through school and college curricula dates back to the early half of the nineteenth century. Pedagogically, there was a tension between two divergent strategies of instruction. On the one hand, there was the strategy proposed by the Orientalists, who suggested grafting modern science on to a Sanskrit base.[1] The Anglicists, on the other hand, proposed that instruction should proceed entirely on Western lines.[2] However, the debate was resolved by the installation of British rule in India following the uprising of 1857, and the Macaulayan Minute more or less dispelled any possibility of dialogue between modern or Western science and the traditional systems of learning. Ironically, Christian missionaries, with their larger evangelical agenda in mind, embarked on the path of promoting science, in the hope that this would stimulate the erosion of traditional knowledge forms and practices and thereby reinforce their own evangelical agenda. However, within three decades they were to realize that the 'native population' had taken to science without having abandoned their own religious beliefs or practices.[3]

In the Calcutta Presidency where these experiments were carried out in a very planned manner, a number of responses from the Bengali educated populace were manifest. The range of responses may be classed under three broad ones. The first was one of revivalism that rejected any form of dialogue with Western knowledge forms and proposed a retreat into the theological traditions of India. The second – at the other extreme – was that of Westernization, and, as suggested, it envisioned the emulation of Western knowledge and the Western model of development, and the consequent abandonment of traditional knowledge forms and practices. The third, called revitalist, argued for the critical assimilation of the developments in Western science and strategies of development, while simultaneously examining critically those elements of the Indian tradition that had not outlived their utility and possibly offered elements that could be salvaged and revitalized in the light of contemporary learning.[4] It shall be argued that attempts to build a national

scientific research system crystallized out of the last strain. In cultural terms, the devalorization of traditional knowledge forms – which was as much a product of the Eurocentrism of the times, as it was a weapon to legitimate colonial rule – prompted the first generation of Indian scientists to commence a historical examination of the sciences of India from the perspective of modern science. In this they were partially inspired by the endeavours of the British Orientalists who preceded them.[5]

Three decades after the Imperial Government had assumed direct control of matters of state pertaining to the Indian empire, the first signs of a nationalist uprising were becoming visible. The uprising was prompted by a number of misgivings and realizations about colonial rule. The new professions that had been created under the colonial regime did not allow the rising aspirations of a newly educated class to find gratification in the new regime.[6] In their continuous dialogue between the traditional knowledge systems and the advances made by the West in the previous centuries, Indian scientists reckoned two primary developments to be of crucial significance to their own situation. On the one hand, they were absolutely convinced of the need for the institutions of a scientific and technological research system on the German model. The installation of such a system would dovetail with the processes of technological and industrial development. But was the Western model of development and industrialization suited to the culture, resources and climate of the Indian nation?[7] This was a question that preoccupied the first generation of Bengali Bhadralok thinkers who were among the pioneers in institutionalizing the scientific research system in India. Convinced of the need for industrialization as the path to development, they were however sceptical of the Western model, and long debated the merits of finding alternative models of industrial development that were more suited to the industrial climate in the country. However, even within this group there were those who came from a background in the engineering sciences and technical disciplines who disagreed with these alternate conceptualizations and pressed for the implementation of rapid industrialization, albeit it under national control.[8]

Sir Mokshagundam Visvesvaraya, a leading engineer of his day and the most important figure spearheading the

industrialization of Princely Mysore, promoted the idea of industrialization with the caveat that India had much to learn from the experiences of Japan, Sweden and the United States.[9] These three nations had object lessons to offer because they were, until recently, lagging behind the industrialized West but had rapidly caught up in a few decades. Thus while the discourse was split between various adaptations of the Western model of industrialization on the one hand, and the demand for retailoring industrial development to work at lower economies of scale not involving mass or consumer-belt production, the unifying feature was that the attempt underway was to achieve economic self-reliance, and this could only be ensured if it was founded on adequate scientific and technological capabilities.[10] The burgeoning nationalist struggle thus refashioned the discourse on science, technology and industrial development to dovetail with an emerging portrait of social transformation, and presented itself as the cultural and political identity of the nationalist movement. This vision of social transformation had to serve a dual purpose, that of legitimating the processes of modernization while simultaneously containing the cultural erosion and devalorization of Indian culture that had been unleashed by colonial rule. This was one of the primary cultural tasks for the critical assimilationists within the nationalist movement.[11]

## EARLY ATTEMPTS AT INSTITUTIONALIZING SCIENTIFIC RESEARCH

Against this backdrop we briefly examine the emergence of some of the early attempts at institutionalizing the scientific research system outside the frame of institutions of science that were constructed as departments under the Imperial government. The emerging nationalist struggle gave concrete form to the scientific and technical institutions founded in the late nineteenth and early twentieth centuries. In 1876, an Indian doctor, Mahendra Lal Sircar, founded the Indian Association for the Cultivation of Science (IACS).[12] The Association was created in response to a pressing demand from educated Indians for the university to cease to be merely an examining body. Throughout the second half of the nineteenth century, Western-educated Bengalis were demanding of the British Government a full-fledged scientific research system. When the IACS was founded it sought to combine the character, scope and objectives of the Royal Institution of Great Britain, and the British Association for the Advancement of Science. Nevertheless, its objective, Sircar pointed out, was to 'carry on the work with our own efforts, unaided by the government … I want freedom for the institution. I want it to be solely native and purely national'. Within a decade the IACS had already become the fount of inspiration for a whole generation of Indian scientists entering the profession of science.[13] The Association that was set up through donations from the landed gentry of Bengal provided laboratory facilities for researchers seeking to pursue a scientific career but unable to find facilities for doing so at the university. As a scientific society it provided the institutional umbrella for popular and learned scientific lectures. By the turn of the nineteenth century it came to embody nationalist aspirations for scientific advancement. The Association blossomed in the wake of the emerging nationalist struggle in the country,

and the greater the reluctance displayed by the imperial administration to accede to the demands of the Association, the greater the resolve on the part of the incipient scientific community to ground their independent efforts.[14] However, it must be pointed out that, in a sense, two of the leading scientific lights at Calcutta at the time, the physicists J. C. Bose and P. C. Ray, reflected a Pasteurian internationalism.[15] By that we mean they were committed to the idea that the progress of science was dependent upon the functioning of an international community of scholars and the collaboration that joined them together. On the other hand, they also recognized that through the advancement of the sciences prestige and economic benefit accrued to the nation. Ray, possibly more than Bose, given his vocation as a practicing chemist, was more smitten by the vision of Berthelot's millennium.[16]

The evolving relationship between science and colonialism during the years of colonial rule is instantiated in the founding of institutions under the rubric of the national education movement and spearheaded by the National Council of Education. These are the Bengal National College – established through the efforts of the National Council of Education (NCE) – and the Bengal Technical Institute, Calcutta, established by a group that broke away from the NCE and started the Society for the Promotion of Technical Education (SPTE). Rather than internal faction fights within the same group, this divide embraced different visions of scientific and technical education – the former emphasizing the national and moral background of a humanist education and the latter pursuing the immediacy of developing technological skills.[17] These attempts were stimulated by a utilitarian vision of modern science and technology, a vision that had acquired currency among the Bengali Bhadralok class as well as other sections of the Western-educated Indian community. The undivided NCE included among its members the scientific and cultural constellation of modern Bengal. It was attempting to extend the research charter of the IACS into the domain of pedagogy: namely, that of founding an educational system on 'national lines' and under 'national control'. While eschewing the framework of Westernization propounded by the Macaulayans, it proposed instead critical assimilation from both the West and East. Through their cultural organ, *The Dawn*, the members of the Council sought to institute a critical examination of tradition and modernity.

In cultural terms the image of science among this educated elite was, to use a phrase from Thackray, that of a radical ratifier of a new world order.[18] Furthermore, science was also seen as the harbinger of economic prosperity and well-being. Within the relatively conservative Bhadralok class it could serve this purpose because science was ensconced within a moral economy that made it morally worthwhile and economically beneficial.[19] The partition of Bengal in 1905 stoked the fire of the nationalist movement and was a major blow to the sense of Bengali identity. The environment was surcharged in addition by the growing unemployment among the new intellectual proletariat that had been created but could no longer find jobs either in industry or government.[20] It was at this time that the NCE intervened by founding its own college whose educational agenda would be at variance with that of the Calcutta University, which was considered tainted since it was under British administration. Scientists such as P. C. Ray and J. C. Bose were clandestinely involved in the enterprise.[21]

The Council split in 1906 into the National Council of Education and the Society for the Promotion of Technical Education. The cause of dissension, as mentioned earlier, appears to have related to the pedagogy of scientific and technical education along 'national lines'. The scientists and engineers were quite sceptical about the humanist angle given to scientific and technical education and suggested that the moral and cultural or national component be dropped altogether; they emphasized the greater importance of developing deeper technical competence. Those from a humanities and liberal arts background went the other way. The two institutions born out of what was once the NCE continued to live separately for about five years. The immediacy of the nationalist struggle, given that both camps were committed to self-rule, and the growing demand for professional engineers and scientists to attend to India's mushrooming industry, resulted in a patch-up between the two camps.[22] The nationalist impulse was to be driven by the imperative of technological and industrial development – this was an element of the perceived contract between the state, on the one hand, and science and technology on the other.

In any case Ray, who in more ways than one carried the cultural authority of the sage-scientist, he was even called *acharya* had given credence to the idea that wealth flows out of the portals of the laboratory.[23] Ray was to write: 'The history of the modern supremacy of Germans in the industrial world is the history of triumphs achieved by succeeding generations of silent and patient workers in the laboratory.'[24] As a leading chemist employed by Calcutta University, Ray had established an industrial enterprise through public contributions, the Bengal Chemical and Pharmaceutical Works, whose products would replace the exorbitant imports from Europe. The new knowledge form and activity thus came to be coupled with aspirations for freedom from British rule. A prerequisite for self-rule (*swarajya*) was economic self-reliance (*swadeshi*).

The important feature of this episode in the history of the institutions of modern science in India is that, in characteristic late-nineteenth-century fashion, two ideas had acquired palpable currency: First, in contributing to science, prestige accrues to the nation; second, the path to political independence must be paved by economic self-sufficiency, which in turn requires an adequate scientific and technological base. Thus when Asutosh Mukherjee took over as the Vice-Chancellor of Calcutta University he set about operationalizing the provisions of the University Act of 1904 that made it possible to combine for the first time the functions of teaching and research. While informally associated with the NCE and their endeavours, Calcutta University provided a much larger teaching infrastructure and had a larger student population, and Mukherjee began revising programmes within the core. He believed that many of the changes demanded by the nationalist movement could be obtained within the framework of the existing universities.[25]

While the nationalist movement was in full swing, Asutosh Mukherjee proceeded to reform Calcutta University within the framework of the new act. It was at this time that Taraknath Palit, disheartened by his efforts to provide for technical education under the nationalist banner, handed over the assets of the Bengal Technical Institute to Calcutta University.[26] By October 1912, Mukherjee had received two donations, which enabled him to provide for two professorships in physics, two in chemistry, and one each in botany and applied mathematics

at Calcutta University. The Palit Professorships in chemistry and physics were the first two university chairs in science to be founded in India. One of the conditions imposed by the donors was that all chairs founded from their benefactions should be exclusively held by Indians.[27] By 1915, a substantial school of research in the areas of physics and chemistry had been established within Calcutta University through the research programmes initiated by J. C. Bose and P. C. Ray. C. V. Raman moved from IACS to occupy the first Palit Professorship Chair of physics at Calcutta University. The research agenda for the university stood legitimized.

Ray's nationalist impulse and belief that scientific research applied to the task of industrial development could render the nation economically self-reliant led him to establish Bengal Chemical and Pharmaceutical Works (BCPW) in Calcutta. He endorsed Mahendra Lal Sircar's belief that 'It is the chemist who must come to the rescue of threatened communities. It is through the laboratory that starvation may be eventually turned to plenty.'[28] As discussed earlier, within the NCE there were those who were dissatisfied with the model of large-scale industrial development and were considering other models of decentralized industrialization more in consonance with the resource base of the Indian rural economy.[29] By the late 1920s, Ray had lost confidence in the programme of large-scale industrialization being promoted by his own students at University College. Earlier, he had dismissed Gandhi's views on heavy industrialization but by the 1920s had become one of its most committed advocates. He recounted: 'When Mahatmaji [Gandhi] in 1921 first made the *Charkha* the symbol of the new movement, I myself, a staunch believer in mechanization, laughed at this relic of medievalism.'[30] However, it was during his involvement with a series of flood and relief operations in Bengal that Ray began to question his commitment to heavy industrialization through the application of science and found Gandhi's views more appealing.[31]

His views were not acceptable to his students, particularly Meghnad Saha, who by now was the leading Indian astrophysicist and was also actively involved in the emerging politics of the Indian National Congress. Saha was greatly influenced by the ongoing experiments in the Soviet Union. Saha's preoccupation with the frequent damage that floods unleashed in India led him to suggest the founding of a school of 'river physics'.[32] The Indian National Congress had advocated a programme of heavy industrialization almost immediately after its inception. This advocacy was muted only during the phase when Gandhi had assumed the leadership of the party, but although his emphasis on cottage and village industries had been incorporated within the party programme, those who held such views did not constitute the dominant faction. Jawaharlal Nehru articulated the worldview of the party in 1937 when he asserted: 'Congress represents science, and science is the spirit of the age and the dominating factor of the modern world. Even more than the present, the future belongs to science and to those who make friends with science and seek its help for the advance of humanity'. As with Saha, Nehru was deeply influenced by developments in the Soviet Union. The year he spent incarcerated in Naini Jail was devoted to reading the writings of Bernal and the other members of the Cambridge Left.[33] In 1938, a National Planning Committee (NPC) was convened with Nehru as its chairman, and several leading industrialists as well as

Meghnad Saha were members. The NPC produced a detailed report in 27 volumes, with a separate volume of views and recommendations on an integrated national plan. Seen in historical context, the NPC forged a common platform in politics, science, technology and industry for the country's leadership.[34] The action plan charted in these documents had much to say about economic independence and political freedom. But more importantly, it contained a kind of blueprint for the institutionalization of the scientific research system and industrialization that would follow after independence.

In 1934, Saha, together with a group of leading Indian scientists, had established the Indian Science News Association and an influential journal, *Science and Culture*. This association of scientists, which came to be known as the 'Science and Culture Group', advocated the utilization of scientific knowledge for heavy industrialization. Impressed by the results of planned industrialization in the Soviet Union, Saha and his group vigorously criticized the Gandhian programme in the pages of *Science and Culture*. But this was not the only ideological orientation that found voice within the national movement. Another vision was taking shape in the state of Mysore then under indirect British rule; and it was initiated by Visvesvaraya.[35]

As an engineer, Visvesvaraya's was a bootstrap vision of development that involved the simultaneous pursuit of three different strategies, or else the desired end results would not be realized. The primary effort had to do with the establishment of a scientific and technical education programme that would produce the necessary capabilities and skills to empower the programme of rural industrialization and the establishment of heavy industry. A plan for rural industrialization was drawn up that included increased acreage for irrigation and a blueprint for industrialization that would add value to the agricultural produce generated in the rural areas and plough it into the rural economy. And there was an ambitious plan for industrialization that would gradually reduce the nation's dependence on agriculture, as was the case in the developed economies. He was reasonably successful in ensuring the integration of these different strategies, since as a state under indirect colonial rule, there were greater degrees of freedom available and Mysore was considered one of the model states in indirectly administered India.[36] It must also be noted that Visvesvaraya published a book on planning, though his model was not the Soviet model but a state-capitalist one – in which the role of the state was to set up infrastructure that would provide the platform for private enterprise to take off. However, in his technocratic vision India's backwardness was ascribed to illiteracy and the consequent lack of skill and working capacity. Industrialization became an instrument of change and was reflected in his slogan: 'Industrialize or perish'. While considered the inaugurator of planning in India, reflected in his book of 1936 and by his association with the Bombay Plan, his approach should be distinguished from the Soviet-influenced approach of P. C. Mahalanobis.

## INDUSTRIAL RESEARCH

The industrial research system, considered as one of the founding pillars of industrial society and its history in India, is by and large the history of the Council of Scientific and Industrial Research (CSIR), the idea for which grew out of the deliberations of the National Planning Committee, the journal *Science and Culture*, and took final shape following the visit of Professor A. V. Hill, Biological Secretary of the Royal Society, to India in 1943. There is a substantial corpus of literature discussing the emergence of the CSIR and the institutions of industrial research founded by it.[37] The important feature to note is that S. S. Bhatnagar became the first head of the CSIR in independent India. It was through his proximity to Nehru that he was able to work towards the establishment of a network of twenty-two of the 'national laboratories' under the CSIR, between 1948 and 1958. The period between 1948 and 1964, within the discourse on planning, policy, or even for the purposes of political history, is alluded to as the Nehruvian era. The important issues of this era may be listed as follows: the path of socialist development was to be pursued; in the realm of international politics India had committed itself to non-alignment; the cultural goal of the age was a brand of scientific imperialism (the core of the new state would be organized around 'the temples of science', and further, the scientific temper was enshrined in the Indian Constitution).[38]

The image of Nehru as philosopher-statesman and Nehru as entrapped within the world of Realpolitik has proved to be the bugbear of most historians. What is certain is that his faith in science was close to religious faith and derived from his perception of the transformation of the world around him. As a historian of merit, whose *Glimpses of World History* and *Discovery of India* have their place on the bookshelf even today, he was able to visualize how the emergence of modern science and technology would profoundly alter the lives and outlook of people in the non-Western world. He sincerely believed that a critical commitment to science could drive the spirit of development of the new nation by igniting the spirit and minds of people: science was to be the principal instrument of rapid change. For Nehru, the human destiny was inextricably and inexorably linked with the progress of science. He once observed nostalgically: 'And though circumstances made me part company with science, my thoughts turned to it with longing. In later years, through devious processes, I arrived again at science, when I realized that science was not only a pleasant diversion and abstraction, but was of the very texture of life, without which our modern world would vanish away. Politics led me to economics, and this led me inevitably to science and the scientific approach to all our problems and to life itself'.[39]

In his view, the solution to India's problems lay in a combination of socialism and science, of technology and heavy industrialization. However, he was not just an uncritical optimist about science. Rather, he was well aware that the monster created by science had run amuck; and this rosy picture of science ushering in the golden age was tainted by the mushroom cloud of darkness that threatened the future of the human race.[40] However, neither he nor his generation of scientists felt compelled to put science in the dock, for variants of the use-abuse model continued to exonerate science, and the ideology of the Cold War reinforced this image of science.

By the early 1960s, a good decade after independence had been achieved, the efforts of scientists from the pre-independence era had proved fruitful, for India was able to proclaim that it had a reasonable scientific and technological research establishment and was rapidly joining the

international community of Big Science. In the last decades of the nineteenth century and the early decades of the twentieth century the attempt was to ground the research system within the university research system. By the time independence had been achieved, and driven by the need to catch up with the West, the imperatives of the new republic to deliver on the promises of development, the imperatives of national sovereignty and prestige – all drew the leadership of the scientific community, politicians and decision makers closer to the trajectory of mission-oriented research. Consequently, in the post-independence era, the industrial research and nuclear research imperatives provided structures for the subsequent institutionalization of science. What is certain is that institution-building on such a large scale, in a nation where resources were tight, was possible only because the scientific community was able to enlist the support of the political establishment for its plans. Furthermore, they managed to link their objectives with the larger development objectives of the independent republic.

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33.   J. D. Bernal quickly grasped the thrust of the movement, for he was to write: 'It is inevitable that in science, as in other aspects of life, the Indian should feel the need for national assertation, but his attitude is always an uneasy one ... In order to release the enormous potentialities for scientific development in the Indian people, it would be necessary to transform them into a free and self-reliant community. Probably the best workers for Indian science today are not the scientists but the political agitators who are struggling towards this end'; cf. Bernal, 1939, *The Social Function of Science*, London, pp. 207–8.
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35.   V. K. Bawa, 'The State and Industry in Mysore: The Role of Visvesvaraya', Seminar on *State and Business in India: A Historical Perspective*, Ahmedabad, 1984; for an insightful study of the political economy of late- nineteenth and early twentieth-century Mysore see B. Hettne, *The Political Economy of Indirect Rule: Mysore 1881–1947*, New Delhi, 1978.
36.   D. Raina, 'Visvesvaraya as Engineer-Sociologist and the Evolution of his Techno-Economic Vision', Lecture delivered at National Institute of Advanced Studies, 7 January 1999.
37.   N. R. Rajgopal, M. A. Qureshi, B. Singh, *The CSIR Saga*, New Delhi, 1991; for a detailed study of National Physical Laboratory of CSIR see Shiv Visvanathan, 1985, op. cit.

38.   Raina and Jain, 1997, op. cit.
39.   Address at the Indian Science Congress, Calcutta,
26 December 1937.
40.   J. Nehru, *The Discovery of India*, Calcutta, 1946,
pp. 620–27.

# 36.5

## THE EVOLUTION OF SCIENCE AND TECHNOLOGY IN INDIA SINCE INDEPENDENCE

*Vissid Siddhartha*

India declared its independence from British colonial rule on 15 August 1947. As already discussed, several of those spearheading the freedom movement – the Indian National Congress – had already begun planning India's post-Independence institutions of industrial, scientific and technological development. The principal planner was Jawaharlal Nehru, the first Prime Minister of free India, whose ties with India's scientific community predated 1947. During the years of anti-colonial struggle Nehru often made public, through speeches and writing, not only his own ideas but also what other anti-colonial political formations expected from science for the development of India and the welfare of its people. But he did so much more frequently after Independence[1] when, as Prime Minister, he retained, *de jure*, ministerial charge in his Cabinet of the portfolio of Atomic Energy, and, *de facto*, of industrial science and technology.

Some of India's few scientists involved themselves in the freedom movement directly; but more did so through their affiliation with the Congress Party. In return, the Party allowed Nehru a great deal of latitude in fashioning the scientific and technological institutions of independent India in close consultation with scientists. Nehru conceived his task as one of building on the legacies left behind by the British.[2] He did not, unfortunately, examine closely the appropriateness of those legacies to fulfil the tasks that were later assigned to Indian scientific effort.

Until well into the 1950s the Indian scientific community remained small. It could only draw upon a university-based research tradition that was barely fifty years old. Its star, the winner of the 1930 Nobel Prize in Physics C. V. Raman, shunned government and its patronage, which lesser beings knew could not be done without.

And so Indian science gave a warm welcome to the state. The latter moved in gingerly in a self-effacing style that was in stark contrast to the unabashed machismo it displayed in the proclamation, in its Industrial Policy Resolution of 1956, of the intent of the state to occupy the 'commanding heights' of the industrial economy. In a statement in the Lok Sabha (Lower House of the bi-cameral Indian legislature) on 13 March 1958, Nehru tabled a copy of his government's Scientific Policy Resolution[3] and personally read it out, 'because we consider this Resolution as an important one, defining our attitude to science and technology generally.' This favourable attitude by the head of government in the highest political forum enabled India's young scientists, nascent as a community, to draw upon the resources of the state for programmes to be conceived and executed almost exclusively by them. Thus empowered, the community proceeded with the task of building fairly rapidly independent India's scientific institutions, into what is today the most extensive and dense of the scientific networks in the world's ex-colonies, save that of China.

The scientific community did not, however, quite get the point of the *quid pro quo* implied in the Scientific Policy Resolution, which was sought to be implemented 'by offering good conditions of service to scientists and according them an honoured position'. Consequently, the political cover and the needed protection that Nehru provided to the supply-side institutions of Indian science from the depredations of politicians and hostile bureaucrats also isolated the world of Indian science from its intended beneficiaries and customers. Scientists at leading centres and institutes worked in a 'hot-house' atmosphere, as they sought only to fulfil the targets of 'Plans' validated by a political system that was assumed to be conveying to the scientific community the needs of society through those 'Plans'. The 'hot house' also enabled the leading members of the community to gratify their need for recognition by their scientific peers abroad. What was scientifically fashionable was pursued, and this fashion was set in the West. While these practices enabled one type of international calibration of Indian science, they also resulted in a disconnection of the scientific research system from the Indian real world.[4]

Nehru had a special relationship with two of the major post-Independence scientific institution builders, Homi J. Bhabha and Shanti Swaroop Bhatnagar. Bhabha was a man with an aristocratic background and private financial means. His ancestors, who professed the Zoroastrian faith, had migrated from Iran and settled down in India centuries ago. Bhabha, who masterminded India's Atomic Energy programme,[5] was empowered, on his demand, with custom-designed administrative and financial enablements that were at refreshing variance with the disabilities hobbling the

other research establishment, headed by Bhatnagar, namely, the Council of Scientific and Industrial Research (CSIR) – a British legacy. Bhabha subsequently institutionalized a style of 'science governance' that has since become the norm for other post-independence 'high-technology' mission-oriented science and technology agencies in India, notably those overseeing the Space and Electronics programmes.[6] China, the giant neighbour to whom India lost territory in a war in 1962, conducted a nuclear weapons test in the atmosphere in October 1964. Two years later Homi Bhabha was killed in an air-crash in Switzerland. The departure of both Nehru and Bhabha, in quick succession, disrupted the rhythm of science governance in India. When Nehru's daughter Indira Gandhi became Prime Minister (after the death, not of her father in May 1964, but of Prime Minister Lal Bahadur Shastri) in 1965, India had already fought a stalemated war with Pakistan, which confirmed that India's industrial science and technology were not up to the task of supplying the military. Also, by the mid-1960s it became apparent that India's traditional agricultural system could not feed her rapidly growing population. Indeed, in 1966–67, India faced a food crisis, which raised the spectre of starvation and loss of national pride. India had to import food from those 'who had the means to give and did not give it without strings attached'. Scientists, politicians and influential commentators started asking: 'What is this science for; what is our technology meant to do?'

Those then were the contemporary historical circumstances in which Indira Gandhi asked for the convening in January 1970 of the historic Third National Conference of Scientists, Technologists and Educationists. From this conference's accepted recommendations there emerged the National Committee on Science and Technology (NCST) with a mandate to plan for the next phase of India's science and technology development. It did so, but now in a radically changed context of political-economy,[7] a change brought about in part by a five-fold increase, since the Scientific Policy Resolution of 1958, in the state's expenditure on scientific research and development,[8] and a four-fold increase in the number of personnel engaged in R&D and related activity.[9] Five Indian Institutes of Technology and a research-based medical university were fully functional, producing world-class technologists and medical specialists through English-language instruction – indeed, so world-class that the trickle brain drain to the First World (mainly the United States) that began in the mid-1960s presaged a future flood (which continues).

The war between Pakistan and India in 1971 saw the birth of the new nation of Bangladesh in South Asia. This war refocused India's attention and resources on strategic technologies, but now on those with 'dual-use', i.e. those which would be invested in primarily for development purposes, but which could also be used to military advantage.

In the fourth five-year plan, between 1969–70 and 1973–74, India's science and technology expenditure increased by a factor of five over the third plan, which ended in 1966. The Departments of Science and Technology and Electronics were created in 1971; the Department of Space was set up in 1972.

In 1974, Indira Gandhi authorized India's first underground nuclear explosive test in the desert of the Western border-state of Rajasthan, thus demonstrating a nuclear weapons capability. In 1980 India successfully launched, with its self-designed launch vehicle SLV-3, an artificial satellite that it also designed and made. She thus demonstrated the capability to build Intermediate Range Ballistic Missiles (IRBMs). Indira Gandhi continued this phase of institutional expansion of Indian science and technology on the 'supply-side' with the creation in the early 1980s of the government departments of Environment and of Ocean Development, with scientists in good standing in their fields hand-picked and appointed by her as their executive heads. ('My scientists', she would say to career bureaucrats, who got the message.)

In the mid-1970s, imported oil became almost unaffordable. The impact of this, and environmental problems caused by large hydroelectric projects[10] and coal-based power stations, compelled India to harness non-conventional energy sources. Indira Gandhi created the Department of Non-Conventional Energy Sources in 1982. By the mid-1990s India had the world's fourth-largest installed capacity of grid-connected electric power generated by the wind.

With nuclear weapons and IRBM capabilities clearly demonstrated, Indira Gandhi considered it now safe for India to begin to open up her economy. The almost religious adherence to near-autarchic self-reliance in the decades previous to 1980 was relaxed. Inevitably, as a corollary, Indira Gandhi's own stamp on the Nehruvian S&T model she inherited needed redesign. That redesign was incorporated in the formulation of a technology policy whose content she personally attended to. Indira Gandhi had to personally inform her special constituency – the scientific community – before effecting the impending change. She did so by releasing the 'Technology Policy Statement' at the Indian Science Congress in January 1983. But she was distracted by a terrorist insurgency in the border state of Punjab, and the administrative follow-through into implementation of that policy statement died with Indira Gandhi when she was assassinated in October 1984.

The Congress Party immediately anointed Indira Gandhi's son Rajiv Gandhi as head of the Congress Party. He won a General Election shortly thereafter and became Prime Minister of India. Rajiv Gandhi adopted a different style of executive functioning – a sort of Presidential style. Thus, while hitherto the top science and technology advisory bodies to the political government had been 'Advisory Committees to the Cabinet', Rajiv Gandhi appointed a 'Science Advisory Council to the Prime Minister'. This Council functioned from 1986 to 1990 as a compact body of a dozen members, none of whom were science-agency heads ('I want scientists, not bureaucrats'). Two of its members brought in from the private sector, and another US-based 'brain-drain' Indian telecommunication specialist, were personal friends of Rajiv Gandhi. Partly because of this unorthodox membership and also partly because this body went about its tasks in a way that alienated the Agency Heads – the science czars of the Indira Gandhi years – the latter did not consider the Council as legitimate ('Who *are* these guys?'). The Council, headed by an internationally honoured academic (the Director of the Indian Institute of Science in Bangalore) produced a two-volume report titled 'Perspectives in Science and Technology', which was later published.[11] In the meantime Rajiv Gandhi lost office in a General Election (he was later assassinated). The czars

respectfully placed the two volumes on the academic shelf, where they remain.

Following the collapse of the Soviet Union in the late 1980s, and its subsequent break-up, India realized that the relatively easy availability from that source of conventional munitions, combat aircraft and warships at 'friendship prices' was going to dry up. There was no alternative to providing for the requirements of the Indian armed forces from domestic military-oriented R&D. This activity therefore rapidly became the single-largest chunk of government-funded R&D, and has remained so ever since.

As Prime Minister, Rajiv Gandhi also explicitly authorized the application of India's nuclear capability to making weapons and authorized the test launch in May 1989 of India's Intermediate Range Ballistic Missile (IRBM), Agni-I. In May of 1998, Prime Minister Atal Bihari Vajpayee made good a pledge in the manifesto of the political alliance, which he led into power. Disregarding likely adverse international repercussions, he authorized a series of underground nuclear weapon tests, which were successfully conducted that month. In April 1999, Vajpayee approved the test-launch of the improved version (Agni-II) of India's IRBM, also successfully accomplished.

Thus, 50 years after the founding of the Indian Republic, the actually implemented post-Independence policies for the development of science and technology could, in retrospect, be viewed as having been largely driven by a continuing search for 'non-aligned' security, and to provide India with some insulation from the world's post-war neo-colonial structures of intertwined strategic, economic and technological power. A core element of India's science and technology effort this past half-century has been the attainment of self-sufficiency in food. India has also sought geo-technological parity by declaring herself a Nuclear-Weapons State, and by being one of five space-faring nations with an autonomous, economically and technologically competitive space-based communications and surveillance capability. These scientific and technological goals have been achieved at a remarkably low cost that has rarely exceeded 1 per cent of India's GNP in any year.

The modicum of self-reliance attained in non-security-related industrial development has been driven by public-investment from domestic saving, rather than technology provided through the pursuit of domestic R&D. This investment has carried with it technology embodied in imported capital goods, which is rarely leading edge, except when capital goods have been chosen by very bold (and therefore rare) domestic public-investment decisions not predicated by the terms of tied foreign-aid or loans from foreign banks.

This is not to say that there has been little contribution from domestic science and technology to India's industrial production. Indeed, an estimated 100 thousand million[12] Rupees worth of annual industrial production now results from the cumulative commercialization of industrial R&D conducted in Indian publicly and privately owned S&T facilities, many of which were set up with tax and other incentives introduced in the 1980s. Perhaps the most significant of the values added by domestic S&T to civilian industrial production, and exports, has been in drugs and pharmaceuticals. In 1970 Indira Gandhi got Parliament to completely change the law on patents left over from British times. The Indian Patents Act of 1970 abolished product patents on drugs. This measure has been responsible for

moving India from being an importer of medicines at prices her millions could barely afford, to being a seller to global corporations of licences to produce pharmaceuticals with technology developed in Indian laboratories.

And so, as we enter the new millennium having surveyed India's long history, her colonial burdens and legacies, and her post-Independence security anxieties and preoccupations, one asks: Could India's science and technology development this past half-century have taken a different path? It is, perhaps, too early to answer.

## NOTES

1.    For a well-selected set of these see B. Singh, *Jawaharlal Nehru on Science & Society: A Collection of his Writings and Speeches*, Nehru Memorial Museum and Library, New Delhi, 1988.
2.    A handy account of these legacies is available in: R. Macleod, and D. Kumar, *Technology and the Raj: Western Technology and Technical Transfers to India, 1700–1947*, Sage, New Delhi, 1995.
3.    Government of India, *Scientific Policy Resolution, No. 131/CF/57* dated 4 March 1958.
4.    For a perceptive analysis of these and related ailments see D. Mukherjee, 'Indian Science: Policy, Organization and Application', *Economic Times*, New Delhi, November 19–20, 1963 (i.e. written before Nehru died in May 1964). Also excerpted in *Minerva*, Vol. 2, No. 3, 1963.
5.    For an official historical account of India's Atomic Energy programme see: *Atomic Energy in India, 50 Years*, Publications Division, Department of Atomic Energy, Mumbai (India), August, 1998.
6.    For an account of the two styles of science governance in India, see R. S. Anderson, *Building Scientific Institutions in India: Saha and Bhabha*, Occasional Paper Series, No. 11, Centre for Developing-Area Studies, McGill University, Montreal, 1975.
7.    For what the NCST accomplished in that context of political economy, see V. Siddhartha, 'Private Science and Public Policy', in: K. D. Sharma and M. A. Qureshi (eds) *Science, Technology and Development: Essays in Honour of Prof. A. Rahman*, Sterling Publishers, New Delhi, 1978.
8.    Which expenditure has, nonetheless, very rarely exceeded even 1 per cent of India's GNP in any year since Independence.
9.    The oft-quoted figure of India having the 'third-largest pool of scientific manpower in the world' is wholly incorrect. India's rank in the world on this account is in the teens, the actual figure depending on definitions.
10.   On plans for a hydroelectric dam in the foothills of the western Himalayas Indira Gandhi commented in files: 'the only people this dam will benefit are the construction contractors.'
11.   *Perspectives in Science and Technology*, Vikas Publishing House Pvt. Ltd., for Department of Science and Technology, Government of India, New Delhi, 1990.
12.   One hundred Indian Rupees are worth approximately US$12 on the basis of purchasing power parity.

# 36.6

## THE DEVELOPMENT OF NATIONAL SCIENTIFIC AND INDUSTRIAL RESEARCH

# 36.6.1

## SCIENCE AND TECHNOLOGY IN PAKISTAN

*Faheem Hussain*

## INTRODUCTION

The development of science and technology in Pakistan since its independence in August 1947 represents some of the achievements and drawbacks of independent postcolonial governments that came into existence in the aftermath of the Second World War with the collapse of the great European colonial empires. It also represents all the drawbacks and meagre achievements of scientific and technological development driven from above without any organic links to society in general and to industry in particular. Although on paper there are many scientific research institutions in Pakistan, in reality the level of scientific research is extremely low.

Pakistan did not inherit any scientific institutions from the British Indian Empire and its educational base was extremely weak at the time of independence in 1947. At that time the University of Punjab was the only university in what is now Pakistan. However the University of Sind had been approved in 1946 and it opened in 1948. In addition there were three professional colleges, Maclagan College of Engineering and Technology, King Edward Medical College, Lahore, and the College of Agriculture, Lyallpur (now called Faisalabad).[1] Another drawback was that the two universities, following Macaulay's policies, were not conceived by the British as knowledge-producing institutions but merely as teaching institutions where students were taught to become good servants of the Raj. Thus Pakistan started its history without any tradition in scientific research. Everything had to be built from scratch. Like all newly independent countries Pakistan felt that it should also develop its own independent scientific and technological capabilities. There were a few individual scientists in Pakistan at that time who played a crucial role in the future development of education and science in the country.

Given the woeful lack of trained manpower, the initial effort was towards developing universities and educational institutions for the training of manpower in general and in science and technology in particular. An Education Commission was set up in 1958 and a Scientific Commission in 1959, and they duly made their recommendations. These recommendations were partly implemented and as a result the Agricultural College at Faisalabad was upgraded to the Agricultural University at Faisalabad, and the Engineering College in Lahore was upgraded to the University of Engineering and Technology. The number of universities has grown steadily since then and at present there are 26 public and 10 private universities. In addition there are four public and six private degree-awarding institutes.[2] Private universities have been allowed since the beginning of the 1980s when the first private university, the Aga Khan University, came into existence in 1983.

The creation of science and technology research institutions was taken up seriously in the 1950s. In the early years, before there was any significant local scientific base, these institutions were usually modelled on similar ones in the United Kingdom. Major government institutions like the Pakistan Council of Scientific and Industrial Research (PCSIR), Pakistan Atomic Energy Commission (PAEC), Pakistan Medical Research Council, Central Cotton Committee and the Food and Agricultural Council, later renamed the Pakistan Agricultural Research Council (PARC), were all established in the 1950s. Most of the progress Pakistan has made in science and technology originated during the tenure of President Ayub Khan, who made the first political commitment to science and education.[3] He gathered around him Pakistan's prominent scientists and appointed an active, young and brilliant theoretical physicist, Abdus Salam, as his Science Advisor in 1961. During this period (1962–69) not only was an infrastructure for science created but there was also a big effort for manpower development. The PAEC was revitalized with I. H. Usmani as its Chairman and Abdus Salam as its most active member. Usmani was a bureaucrat with a Ph.D. in physics who had a passion for science development. It was during this period that the Pakistan Space and Upper Atmospheric Research Commission (SUPARCO), the

Pakistan Institute for Nuclear Science and Technology (PINSTECH) with a 5 MW research reactor, the nuclear power plant near Karachi (KANUPP), Agricultural Research Centres at Faisalabad and Tando Jam and Nuclear Medicine and Radiotherapy Centres at major hospitals, the National Science Council, and the Defence Science and Technology Organization (DESTO) were created. The PAEC embarked on the programme of training more that 500 scientists in areas of experimental and theoretical physics, nuclear chemistry, health physics, engineering and agriculture. These men and women by and large constituted the country's major stock of trained manpower in the relevant disciplines. Subsequent Pakistani leaders continued their support for nuclear technology.

Another example of Ayub Khan's patronage is the Quaid-i-Azam University (QAU) in Islamabad. He had a vision of creating a postgraduate research-oriented university concentrating on research and graduate programmes in science and technology and the 'hard' social sciences. He saw to it that the university was developed properly and that it got international support and collaboration. He used his personal influence for obtaining two crucial grants for the university: a Ford Foundation grant, which was effectively used for short-term international contacts, and a UNDP grant, which was mainly used for the development of experimental facilities and for inviting long-term visitors. The results were encouraging, and, according to peer review, the Institute of Physics at the university was on the international map as an active centre of research in the highly competitive field of theoretical particle physics, in which it was possible to form a viable group in the very beginning. For the first time in the history of Pakistan, a graduate programme leading to the Ph.D. degree was started on a regular basis. The Ph.D.s produced were of top international standard. The above example brings out forcefully the importance of political commitment and patronage at the highest level for a scientific enterprise to flourish.[4]

## SCIENCE AND TECHNOLOGY RESEARCH DIVISION

A Science and Technology Research Division (STR Division) was created in 1964 to give special attention to the development of scientific and technological research facilities. The STR Division was placed under the administrative control of the President of Pakistan. The PCSIR, the PAEC and SUPARCO were all placed under the administrative control of this Division. In 1969 the STR Division was attached to the Ministry of Education, which was renamed the Ministry of Education and Scientific Research. However, except for the three organizations mentioned above, the sectoral research councils – the Pakistan Medical Research Council (1955), the Irrigation Research Council (1964) and the Council for Works and Housing Research (1964) – that were set up to promote activities in specific areas continued to function under the relevant sectoral ministries. Subsequently in 1972, to give special emphasis to science and technology in national development, a separate Ministry of Science and Technology was established, with the Scientific and Technological Research Division as its nucleus. With this reorganization, in addition to PCSIR, PAEC, and SUPARCO, some other research councils and scientific organizations, which were functioning under other ministries, were also transferred to the Ministry of Science and Technology. These were the Pakistan Council of Research in Water Resources, the Zoological Survey Department and Survey of Pakistan. Over the years there have been several reorganizations of the administrative structure of science and technology. Institutes in the fields of electronics, silicon technology, power and oceanography were set up as a consequence of the National Science and Technology Policy which was framed in 1984.

We have summarized the growth of research institutions in Figure 8, which shows the number of R&D organizations established per two-year period since independence. This figure[5] clearly illustrates the relatively rapid growth in the early years of the Ayub regime from 1959 to 1964 and the very large growth in the years of the populist regime of Zulfikar Ali Bhutto from 1971 to 1976.

*Figure 8* **Growth of R&D organizations**
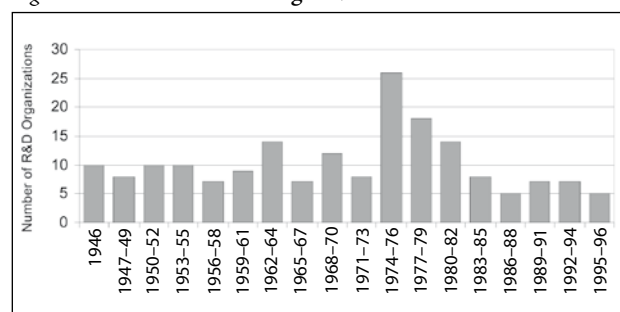


*Source:* K. M. Khan, 1999, *Fifty Years of Science and Technology in Pakistan*, Pakistan Science Foundation, Islamabad.

The Ministry of Science and Technology is the focal agency in the Federal Government for S&T development. The organizations working under this ministry are listed below. Under a recent restructuring the Pakistan Council of Renewable Energy Technologies (PCRET) has been set up. This incorporates within itself the old Pakistan Council for Appropriate Technologies, the National Institute of Silicon Technology and the Solar Energy Research Council. The Pakistan Science Foundation (PSF) was set up in 1973 to support basic research in universities and research organizations on problems of national importance. It also manages the Pakistan Scientific and Technology Information Centre (PASTIC) and the Pakistan Museum of Natural History. The other major R&D organizations, mentioned earlier, are the Pakistan Agricultural Research Council (PARC), the Pakistan Atomic Energy Commission (PAEC) and the Pakistan Space and Upper Atmospheric Research Commission (SUPARCO). PARC is linked to the Ministry of Food and Agriculture, PAEC is directly under the charge of the Prime Minister, and SUPARCO functions under the administrative control of the Cabinet Division. The Kahuta Research Laboratories were established in 1976 as an essential part of Pakistan's nuclear programme. These were later renamed the A. Q. Khan Laboratories after the founder of the laboratory, Dr. A. Q. Khan, a metallurgist who was to play a very important role in the Pakistani atomic bomb project. In 1967 the PAEC set up a Reactor School at PINSTECH to train personnel in nuclear science and technology. In 1976 its name was

changed to the Centre for Nuclear Studies (CNS). This institute provided advanced courses in nuclear technology, nuclear engineering and nuclear medicine. These courses were recognized by the Quaid-i-Azam University for the award of the M.Sc. degree. Recently the charter of this institution has been widened and its name has been changed to the Pakistan Institute of Engineering and Applied Sciences (PIEAS).

The organizations under the Ministry of Science and Technology are as follows:

1. National Institute of Electronics
2. National Institute of Oceanography
3. Pakistan Council of Appropriate Technology
4. Pakistan Council for Science and Technology
5. Pakistan Science Foundation
6. Pakistan Council of Research in Water Resources
7. Pakistan Medical Research Council
8. Council for Works and Housing Research
9. Pakistan Council of Scientific and Industrial Research
10. National University of Science and Technology
11. Central Testing Laboratory.

The Ministry of Science and Technology does not administer all the R&D institutions; some are administered by the respective ministries, while the PAEC and its institutions are attached to the Prime Minister's Secretariat. In recognition of this problem the National Commission for Science and Technology (NCST) was established under the chairmanship of the Chief Executive of the country in 1988 for coordination of the S&T effort at the national level. However, it is very significant that this commission has met only once since its foundation – in 1989.

According to a recent study by the Pakistan Council for Science and Technology,[6] there are 151 major research and development organizations, including universities, in Pakistan. Given the large number of such establishments one would be tempted to think that science has progressed a good deal since independence. However this is very misleading. The tragedy of Pakistan, as of many other newly independent countries, was that its leaders were never seriously interested in developing science and education. They paid only lip service to the development of science. An analysis of recent budgets shows that Pakistan spends only 0.279 per cent of its GDP on science and technology. This includes both development and non-development expenditure. The allocation on development expenditure is even smaller, a mere 0.004 per cent of the GDP.[7] Funds are not available for books, journals and modern scientific equipment. The only exception to this is the generosity towards the PAEC and the A. Q. Khan Laboratory, due to their being engaged in Pakistan's nuclear programme.

## UNIVERSITIES

Although Pakistan has many universities, most of them continue on the colonial path as institutions that impart knowledge rather than modern universities where knowledge is created and where teaching is also carried out. Throughout the world universities are the sites where basic research is carried out but in Pakistan there is no tradition of research at universities. To overcome this, 'Centres of Excellence' were started in the 1970s. These centres were envisaged as research institutes within universities. The country now has on paper nine so-called Centres of Excellence, but none of them has been able to develop to international standard. Table 29 shows the growth of these Centres of Excellence. They lack quality staff, equipment and adequate libraries.

When taken together, all of Pakistan's universities spend only 2 per cent of their annual budget on research, although they possess the largest concentration of trained manpower, i.e. 65 per cent of the Ph.D.-level researchers in the country. However, only 25 per cent of the university teachers report research activity, even on a part-time basis. Calculated on a full-time basis this works out to only a few hundred researchers. Compare this with the figures for the UK

*Table 29* **Growth of centres of excellence**

| | Centre of excellence | University | City | Year established |
|---|---|---|---|---|
| 1 | Analytical Chemistry | University of Sindh | Jamshoro | 1974 |
| 2 | Mineralogy | University of Baluchistan | Quetta | 1974 |
| 3 | Geology | University of Peshawar | Peshawar | 1975 |
| 4 | Marine Biology | University of Karachi | Karachi | 1975 |
| 5 | Solid State Physics | University of Punjab | Lahore | 1976 |
| 6 | Water Resource Engineering | University of Engineering and Technology | Lahore | 1976 |
| 7 | Psychology | Quaid-i-Azam University | Islamabad | 1976 |
| 8 | Physical Chemistry | University of Peshawar | Peshawar | 1978 |
| 9 | Advanced Molecular Biology | University of Punjab | Lahore | 1983 |

*Source*: K. M. Khan, 1999, *Fifty Years of Science and Technology in Pakistan*, Pakistan Science Foundation, Islamabad.

(80,000 university researchers) and for Japan, (200,000). The number of Ph.D.s produced annually in the scientific and engineering disciplines is about 5, compared with 3,500 in India and 5,000 in the UK.[8] The one exception to this bleak panorama is the Quaid-i-Azam University (QAU) in Islamabad. In some departments, like physics and mathematics, QAU has continued to be fairly productive since its foundation. In fact as far as qualified physics staff is concerned QAU was and still is crucial to the development of the atomic energy programme and the burgeoning defence industry. Its physics graduates are highly prized in these sectors. Otherwise there are just a few individuals doing research in other universities.

## OTHER CENTRES OF RESEARCH

Let us now look at the state of the other organizations. Most of the existing 'research' organizations and research councils in Pakistan are so only in name. The actual scientific production in terms of research papers and patents is abysmally low. In the words of Qurashi and Kazi:

> Some of the research councils conduct basic research with the objective of utilising these for applied research and development, whereas some research councils dole out money for research to the universities and medical colleges. However, the major portion of their funding seems to produce results with no immediate applicability, only a venue for conduction M.Sc./M.Phil. Research and purchase of equipment, etc.[9]

This is a very severe indictment but it is borne out by the fact that some of the oldest research councils, the PCSIR and DESTO, have not produced anything of significance in their long years of existence.

According to the above-cited report of the Pakistan Council for Science and Technology, the total scientific and technological manpower in all organizations, including universities, is about 15,000 but this includes M.Sc. and M.Phil. degree holders. Out of this figure about 7,000 are scientists and engineers whereas the rest are technicians. This total figure in itself is extremely low for a country with a population of 140 million (just in terms of manpower, Turkey and Iran, not to mention India, overtook Pakistan in the years between 1962 and 1975; according to the UNDP *1999 Human Development Report*, Pakistan had 0.1 R&D scientists and technicians per 1,000 people compared to 0.3 for India, 0.7 for Iran and 0.3 for Turkey). The real tragedy shows up when one considers the total number of Ph.D.s engaged in research in these organizations, an incredibly low figure of just 1,932! According to K. M. Khan there are a total of about 2,500 Ph.D.s in science and technology in Pakistan.[10] Although about one half of them are in the natural sciences, these figures are extremely low, 110 in mathematics, 225 in physics, 388 in biology, 482 in chemistry. The largest number of Ph.D.s is in agriculture, 668, which reflects the importance of agriculture in the country's economy. However there are very few among them who actually do research of any significance. A recent study, by S. T. K. Naim of the Pakistan Council for Science and Technology and based on impact factors of scientific journals, shows that there are very few productive scientists in the country.[11] For example there is only one

physics department that has any impact at all, and that is the one at Quaid-i-Azam University, Islamabad. Similarly for chemistry the only one that counts is the HEJ Research Institute of Chemistry, Karachi University. Analysis of this survey shows that there are only about 90 scientists who have achieved Cumulative Impact Factors of 20 or above. In terms of scientific output Pakistan had dropped from second/third place to sixth, even in the Islamic world.[11]

Over the years governments have been aware of this lack of high-level manpower and have made sometimes rather half-hearted and misguided efforts to overcome this by instituting programmes to send people abroad for training. The one successful example of this is the training of experts abroad in the nuclear sciences (reactor physics, isotope production, nuclear safety), which was undertaken under the leadership of I. H. Usmani in the late 1950s and early 1960s. Now Pakistan is self-sufficient in training people in these fields. However other such projects have not been successful. The Government of Pakistan initiated the Central Overseas Training Scholarship Scheme in 1964 to train university and college teachers. This was augmented by scholarships offered by friendly countries. The effort suffered and still suffers from severe drawbacks. First of all, considering the magnitude of the problem, it offers a very small number of scholarships, at present (1997) 65 (43 for university teachers and 22 for colleges.[13] Secondly these scholarships have been open to misuse and have often not been given on merit but on recommendations and seniority. Thirdly many college teachers take up the profession as a last resort because they cannot do anything else. Finally university and college teachers who obtained these scholarships were not usually young people in their prime but were those who had been in service for some time and had gone through university and college many years ago. Many of them were interested in getting a higher degree not for the sake of learning but just to get more financial benefits and to enhance their careers. On returning home to Pakistan most of them did not do any more research. Even if some were sincere they could not pursue research in their home institutions because of unhelpful colleagues, lack of a research culture, lack of a research group of critical size, lack of library facilities and equipment. The government does have a limited number of merit scholarships, like the Quaid-i-Azam Scholarship, for students securing a first position in the master's degree, to study abroad for a Ph.D. However, once again, these are very few in number.

Realizing the grave nature of the problem, the Ministry of Science and Technology embarked upon the Human Resource Development (HRD) Programme in 1985. This was the largest R&D training programme ever launched by the government. It envisaged more than 1,600 overseas scholarships, over a period of ten years, for postgraduate studies leading towards the Ph.D. in the latest scientific and technological fields. In the first ten years of this programme about 1,100 scientists, doctors and engineers were sent abroad to pursue their studies, mostly in the USA and the UK.[14] According to Qurashi and Kazi,[15] 535 scholars had returned by June 1996 and were usefully employed, whereas Khan states that out of 1,000 scholars 800 had completed their studies by 1997 and that 200 were 'missing'.[16] This programme was discontinued in 1996 because of resource constraints. Although not very high the success rate was reasonable. The HRD scheme suffered from some

drawbacks, which need to be remedied, if such a scheme is to be revived. The selection process was not rigorous enough to select the best scholars. Some of the scholars selected were just not good enough to compete in the advanced countries and dropped out. Also the selection of the different subjects to be pursued was not done with sufficient care. Hence some of the scholars could not fit into the research environment here on their return because their field was not being pursued, and they either returned abroad or were unemployed. Finally a figure of 500 or 600 is a very small figure given the needs of the country.

Another indicator of the sad state of science in Pakistan are the figures on the number of science graduates, masters, and Ph.D.s produced in the country over the years. According to the study by Qureshi and Kazi, there was a steep initial rise from 1949 to the middle 1960s followed by saturation and even a small decline after 1974.[17] Their study goes up to the year 1980, but the general belief is that this stagnation has continued throughout the 1990s. The total number of M.Phil.s and Ph.D.s produced is extremely small. According to the same study, all the Ph.D. programmes together have been producing barely 10–20 science Ph.D.s annually, including agriculture. In contrast India produces about 900 Ph.D.s annually in the sciences. Pakistan has produced about 500 Ph.D.s in all the fifty years of its existence! One more indicator is the number of students enrolled in higher education as a percentage of the population in the age group 17–23 years. For Pakistan it is 2.6 per cent (1996) as compared to 6 per cent (1990) in India and well down from countries like the Philippines, Republic of Korea, Singapore, Hong Kong, Indonesia, Iran (Islamic Republic of) and Turkey, let alone the advanced industrialized countries.[19]

## CONCLUSION

After painting this dismal picture one is tempted to ask whether there is any science at all in Pakistan, given that it is an atomic power? The answer is yes and no. There are a few groups centred on individuals which do good research work. One obvious success is the atomic bomb programme on which a lot of money has been spent. Obviously Pakistan has mastered the science and technology of making bombs, but this does not signify that physics in Pakistan is in good shape. Making a bomb is a technology which is more than 60 years old and which can be acquired by any country if it is willing to spend vast amounts of money. However because of the atomic bomb project (which required purification and enrichment of uranium, the use of metals and alloys, development of triggers, control and real time fast data acquisition among others) and the requirements of rocket development and other defence needs, significant progress has been made in certain fields like geology, laser optics, electronics, chemistry, material sciences, plasma physics and computer technology. In general, the PAEC has been quite successful in its human resources development programme and has also set up a number of good research institutions for applications of nuclear energy in agriculture, medicine and industry. Also, together with the A. Q. Khan laboratories, PAEC has made more contributions to the defence industry, other than the development of the bomb, than the specially set up defence science organization, DESTO.

However in other fields of basic research the situation is truly dramatic. Research in the fundamental natural sciences of physics, chemistry, mathematics and biology is at a very low level, and falling. As mentioned above there is only one physics department worthy of the name and the same is true for chemistry. The one field where research has paid dividends to the nation is agriculture, where a significant portion of the state science budget was spent in the last 50 years. Several new varieties of wheat, cotton and pulses were developed. However this does not show in the impact factor analysis because most of the agricultural scientists publish in local journals. As stated earlier most of the so-called research institutions are not worthy of the name. In fact the situation is so dramatic at the time of writing that even an immediate injection of more money would not help to ameliorate the situation, as there are no scientists who could use this money productively. In fact the Pakistan Science Foundation in the last few years does not receive enough good research proposals to fund and ends up with money unspent.

There are essentially three explanations for why such a large number of institutions were not productive. One is that they were built by central planners without regard to availability of trained personnel. Good institutions are built around towering individuals or with the knowledge that there is a minimum critical mass of scientists in a particular field to support such an institution. If these conditions are not met the institution will be a failure unless immediate efforts are made to train a sufficient number of scientists very quickly. This is well illustrated by the few research institutes that do function in Pakistan. The HEJ Research Institute for Chemistry was built by Salimuzzaman Siddiqui, a renowned chemist, who was able to build up an excellent institute doing high-class research and producing good Ph.Ds. The institute also attracted other excellent young scientists to join it. The same is true for the Department of Physics at QAU, which was built by the internationally known physicist Riazuddin, who was fortunate, in the late 1960s, to have a pool of very talented young theoretical physicists working abroad at that time and who were willing to return. It is interesting to note the role of Abdus Salam, the Nobel Prize winner. Although he had not yet been awarded the prize at that time, he was already internationally renowned by the late 1950s and was able to attract a large number of Pakistanis to study at Imperial College. Riazuddin himself was a student of Salam. These young people formed the core of the newly established Physics Department at QAU in the late 1960s and the early 1970s. They helped to establish a tradition of research, which was absent in Pakistan until then, and it is being maintained. On the other hand when the PAEC was founded in the 1950s there were hardly any nuclear physicists in the country. However, here again Salam was crucial. He convinced the then Chairman, I. H. Usmani, to send a large number of students abroad to study physics. These people were guaranteed jobs in the PAEC and the strategy paid off. Secondly, institutions were regarded as a collection of buildings with a Director and a bureaucracy and a collection of research officers. Very little money was provided for actual research, i.e. for equipment, chemicals or libraries. The third reason why most of the institutions were unsuccessful was the development model followed in Pakistan after independence. The new institutions were not organically linked to the

industrial development of the country. Unlike India, which insisted on indigenous industrial development with protection for local industries, Pakistan followed World Bank and IMF advice in opening its markets to manufactured goods from the industrialized world. Apart from the textile industry and small-scale manufacture Pakistan did not try to industrialize. It still has only one steel mill to its name. Industrialists were encouraged to buy turnkey projects from abroad with no linkage to the scientific and technological base of the country. An additional reason was that the political leaders of Pakistan were never convinced of the importance of science. Science and education were never a priority in Pakistan. Unlike the enlightened leadership of Nehru and the Congress Party in India, who believed strongly in the transforming power of science, the Pakistani political class, consisting mainly of landlords, viewed science and technology as a luxury. Except for a brief period during Field-Marshal Ayub Khan's dictatorship not many resources have been set aside for the development of science and technology. The dramatic growth of R&D institutions during the Bhutto years had more to do with his populist ideas than a real commitment to science. Planners do not see science as a long-term investment for the future of the country, but rather as short-term costs.

Finally, there are cultural reasons why science has not taken root in Pakistan. At the time of independence Pakistan had only a few scientists and no culture of research and inquiry. Although the first can be addressed by sending people abroad to study, the second is a very delicate plant, which needs nurturing. Science is taught in schools and colleges as if it is something to memorize. Universities are still considered to be places where knowledge is imparted rather than where knowledge is discovered. To actively promote scientific discovery means giving researchers a supportive atmosphere for research: freedom from financial worries, freedom to travel to conferences and institutes abroad, good library facilities and good equipment. These have always been in short supply. All the blame of course does not lie with the government. Much of the blame lies with the scientists as well. Lacking a scientific culture and with the absence of peer review and competition many scientists regarded a Ph.D. as a certificate to retire. Being guaranteed a permanent job, many did not feel the inner necessity to do research and compete on the international level; they took the easy route of putting the blame on lack of resources even when this was not the case.

Given its track record up to now, the future of science looks very bleak in Pakistan unless something drastic is done. The only area developing rapidly is in computer sciences, particularly software development. There is now a boom fuelled by easy access to the Internet, relaxation of duties on computer parts, and by many private sector and government-funded institutes providing training. This is one sector where Pakistan can be truly competitive and there is hope it will take off. The other areas where science

should flourish are those related to defence and atomic energy, as a lot of resources are being diverted towards them. Since the success of the atomic bomb explosions in May 1998 Pakistan has committed even more resources towards the defence industry, particularly in rocket development. Much of Pakistan's science budget is hidden in the defence sector and surely this will lead to significant developments in certain fields related to rocketry and atomic bombs. However the quality and quantity of this kind of research is difficult to evaluate because of its very nature. It is true that the needs of defence have been one of the leading factors in the development of science and technology in industrialized countries over the last four hundred years. This dynamic was particularly evident in the United States, where massive spending on science after the Second World War was directly related to defence needs. Whether the same dynamic will occur in Pakistan, with research in defence-related industries acting as a motor for the general development in science, is still to be seen.

## NOTES

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# 36.6.2

## SCIENCE AND TECHNOLOGY IN SRI LANKA

*Susantha Goonatilake*

### INTRODUCTION

The twentieth century began in Sri Lanka against the backdrop of certain events in the sphere of political economy as well as science and technology. There was a consolidation of British power after the fall of the Kandyan Kingdom in 1815, while forces of resistance continued to oppose British presence. These tensions were reflected throughout society, including in science and technology.

The United Kingdom was heir to a large reservoir of knowledge that had grown exponentially in the previous two centuries following the Industrial Revolution. Formalized knowledge of the physical world in Sri Lanka had many commonalities with the rest of the subcontinent. Some of this knowledge was ahead of the West until well into the twentieth century. And some, such as knowledge about plants, had passed through Garcia d'Orta and Linnaeus into a modern system of classification. In the late nineteenth and early twentieth centuries a new physics was being formed which required new orientations to reality. A nexus between the ideas of Western philosophers such as David Hume and Ernst Mach – key influences on Einstein and Schrödinger – and newly discovered South Asian philosophical sources, prepared the ground for the new physics.[1]

Thus S&T was a product of the interaction between Western interests and that of local reformers. Foremost among the latter was Angarika Dharmapala, the founder of international Buddhism, who wanted the establishment of industrial schools, the assimilation of modern S&T, and who rejected mere imitation. He recommended, among other things, learning from the Indian, Japanese and American experiences.

In the nineteenth century a few key institutions played an important role in introducing Western sciences. The Survey Department is an example. The Colombo Museum was established in 1877 with sections on history, biology, geology and mineral sciences. As part of the satellite gardens created around Kew Gardens, a Royal Botanic Gardens was established in Peradeniya. A Bacteriological Institute was established in 1900 (gradually transformed to become the Medical Research Institute in 1945). A Mineral Survey with Ananda Coomaraswamy as its head was formed in 1903. The latter, like Dharmapala, was influential in

pan-Asiatic debates, but unlike Dharmapala he rejected modern technology, sharing some parallels with Gandhi in this regard.

Large Buddhist monastic universities dating back to the pre-Christian era imparted lay knowledge as well. The last such large monastic university goes back to the sixteenth century. Such centres were re-established during the Buddhist Renaissance of the nineteenth-century: 1873 and 1875 being significant dates. Some of the nineteenth-century reformist monks were in touch with the major minds in the Western world at the time. However, the curricula these monks developed were still strongly oriented along traditional lines. In contrast, the Ceylon branch of the Royal Asiatic Society, founded by the British in 1844, became a clearinghouse for knowledge from both civilizations.

Westerners introduced and studied new plants in the early 1820s. This was the beginning of agricultural research. In the last half of the nineteenth century agricultural research related to the effects of pests, diseases, soil and climate on crop yields. Formal agriculture research began with an experimental station at Peradeniya in 1901, followed by a dry zone research station at Maha Illupallama in 1903. The Ceylon Agricultural Society, formed in 1905, led to the formation of the Department of Agriculture in 1912. By the latter half of the nineteenth century the British had established tea and rubber and some coconut plantations that were in Sri Lankan hands. Research Institutes for these crops were established respectively in 1910, 1918 and 1928.

### CENTRES OF RESEARCH AND SCIENCE POLICY

A Western medical school was first established in 1870 and a technical school was set up in 1893 to train lower-level technical cadres. The University College was founded to prepare students for University of London examination and was converted into a full-fledged university, the University of Ceylon, in 1942. The university system since then has expanded rapidly. A second campus was formed in 1949. Two of the centres formed in the nineteenth century as heirs to the ancient monastic universities were converted into Western-type universities and in the process lost their earlier monastic heritage. By the end of 1996 there were

12 national universities all teaching science subjects, while a few of them had attached faculties of (Western) medicine and/or engineering. There were also postgraduate institutes in the fields of agriculture, medicine, and science. By the end of the millennium (1994) these institutes were turning out 2,346 science graduates and 840 engineering graduates per year. At the same time (1995) the total number of students pursuing postgraduate courses in science-related subjects had increased to 1,730. Those offering postgraduate courses in medicine accounted for roughly half this figure, while agriculture science accounted for about 25 per cent.[2] But the expansion of both higher education as well as research in S&T had not resulted in a parallel increase in the country's proportionate expenditure on R&D. R&D expenditure reached a figure of Rupees 1,410 million (roughly US$31 million) in 1996 but as a percentage of the country's GDP had dropped from a figure of 0.3 percent in 1966 to 0.19 in 1997.[3]

Although organizations like the Royal Asiatic Society dated back to the early nineteenth century, a key fillip to the natural sciences was provided by the formation in 1941 of the Chemical Society of Ceylon. The members of this society then went on to establish the Ceylon Association for the Advancement of Science in 1944. This organization (later renamed the Sri Lanka Association for the Advancement of Science, SLAAS) has acted as a major forum for scientific discussions as well as the principal venue for the presentation of research results for most science disciplines. The SLAAS has been a major campaign forum for science policy related issues, resulting for example in the formation in 1968 of what is today named the National Science Foundation. There are also today individual professional associations for engineering, medicine, biology, physics, architecture, and surveying (as well as associations for several constituent sub-disciplines).

The desire of the scientific community to formulate and implement an effective science policy regime has not been realized. This has been largely due to a lack of high-level support. The closest any political regime came to supporting a serious science policy was with President J. R. Jayawardene in 1984. But this project collapsed because of the latter's lack of trust in his science advisor, a practicing chemist with a good career in the US, but without much insight into science policy or the local scientific community and its requirements or ethos. Scientists eventually rejected the policy plan. In the absence of a firm science policy, the system has been subject to many vicissitudes. Following a late start, it was hoped that some directions would have been the outcome of this policy perspective. The open market reforms of 1979 produced uncertainty that resulted in further transforming the environment of science and technology. The shift to an open economy from a protected, import substitution economy was not managed, as it had been in India or the Republic of Korea.

Previous policy initiatives directed at local capacity building in technology and the related attempts to install an industrial R&D system were now dismantled. It was cheaper and more convenient to buy technology off the foreign market than to develop local capacities. Similarly, successive governments initiated changes against the views of the local scientific community. These included the Science and Technology Development Act of 1994 and the establishment of a National Research Council in 1997. However, for the first time a Ministry of Science and Technology has been operational since 1994.

The output of S&T in Sri Lanka is difficult to measure. Given the small size of the community many sub-disciplines do not figure on the nation's S&T map. In some, such as disciplines like mathematics where sophisticated scientific equipment is not required, the number of researchers is so small that the system is sub-optimal. But in areas such as crop research there is a critical mass of researchers. Here research is sometimes applied directly. The three plantation crops of tea, rubber and coconut are funded by a tax on these crops, thus directly linking the outlay on research with the latter's contribution to output. There is also a dense network of connections between these local institutes and counterparts elsewhere.

In contrast, are the industrial research institutes such as the Ceylon Institute of Scientific and Industrial Research (CISIR) and the National Engineering Research and Development Centre (NERDC), established respectively in 1958 and 1974. The research output from these institutes has not fed the industrial system in a significant manner. Part of the reason is that industrialization has proceeded through the transfer of technology and has not responded to local technology inputs. The CISIR in the mean time has transferred some technologies to small-scale industries such as the food processing sector, for example in creamed coconut, cashew, chutneys, fruit jams, herbal toothpaste and mustard paste. But apart from this, the CISIR is limited to quality control and testing and troubleshooting in established industries. Further, both the CISIR and NERDC suffer from inadequate linkages with both industry and university academia.[4]

Another measure of scientific output is papers, for example those published in international journals and captured by the SCI, or papers presented at the Annual Sessions of the SLAAS following local peer review. There is no single journal in Sri Lanka that is captured by the SCI. SCI-cited publications have fluctuated in the last twenty years roughly between 100 and 200. Bangladesh produces around twice as many. In Sri Lanka, of the SCI included papers, physics and chemistry accounted for about 35 per cent, medicine 25 per cent, biology 25 per cent, agriculture 10 per cent and engineering 5 per cent.[5] The SCI is not necessarily a measure of excellence. It is basically a measure of recognition through peer review in the international community (meaning primarily in the Western world). But as in the classic case of the Indian mathematician Ramanujan, scientific excellence can be hidden for a long time from international recognition. Physics and chemistry constitute the bulk of Sri Lanka's research publications. Formal medicinal plant research had begun in the late 1930s and some physics research in the 1940s. This was largely a continuation of Ph.D. research undertaken by academics returning from their studies abroad. A major area of research with a large number of local and international publications has been in natural products chemistry using a strategic resource – plants. Other areas of research in chemistry include analytical chemistry, physical chemistry and environmental chemistry. There is virtually no research activity in organic synthesis, organometallic chemistry, theoretical chemistry and pharmaceutical chemistry. Research in physics has been relatively lacklustre, but the physicist C. Tennekoon, working in the area of photo catalysis and solar cells, has over 300 international publications in prestigious journals.[6]

In medicine, major areas of research include malaria, heart disease, intestinal diseases, agrochemical poisoning, maternal and child health, viral infections, stress in armed conflicts, nutrition, filariasis, reproductive health and rheumatic heart disease. The fact that the country is infested with malaria has prompted the development of an important research centre at Colombo University. A strongly motivated researcher, Kamini Mendis, leads the centre. The centre has forged a strategic partnership with WHO, and its members are in communication with other such centres around the world. The group is highly productive and is in the global forefront of malaria research. The costs in international terms have been low.[7]

Agricultural research is conducted by a large number of organizations, over ten ministries and several statutory bodies. Further, the formation of the Postgraduate Institute of Agriculture in 1975 was a significant step. By the year 2000, the Institute had undertaken over 200 research projects. Around 55 crops were covered in agricultural research. These include crops outside the main ones of rice, tea, rubber and coconut – such as horticultural crops, cut flowers, foliage plants, and vegetables. The technical manpower is spread out over several institutes. However, since the infrastructure is limited and shared by several institutes, it is difficult to operate a large number of research projects. In the case of plantation crops, research and extension have been closely linked, resulting in the rapid uptake of research results and thus productivity increases. By the late 1990s, links between university-based agricultural research and the research undertaken by the Departments of Agriculture and Export Agriculture were formalized with the objective of promoting research efforts and accelerating the adoption of technology.[8]

The Asian Development Bank has funded an important five-year programme designed to strengthen local human resources in selected key areas. The aim is to develop centres of excellence in selected institutions that are internationally competitive. This involves the training of selected persons abroad for postgraduate research and the elimination of bureaucratic delays blocking the training schedules of scientists. The Ministry of Science and Technology has recently created a Technology Transfer Unit that manages a research fund for innovative pilot projects, and promotes innovation clubs in schools and universities and the establishment of technology parks at industrial research organizations and universities, and it is now suggested that university-based companies be set up.[9]

As Sri Lanka is becoming assimilated into the economy of the Asian region, aspects of her traditional – both indigenous and modern – knowledge systems are now being emphasized. Traditional botanical and herbal knowledge is now of significance for chemical research on natural products. Attempts are being made to bridge the gap between modern science and useful aspects of Sri Lanka's classical heritage. Aspects of Buddhist psychology have been researched in Western laboratories and are found to be of relevance for contemporary practice. But this programme of bridge building has had some unfortunate aspects. Some none-too-rigorous scientific programmes have been taken up at research institutes. Granville Dharmawardene and key members of the SLAAS Popularization of Science Committee have been propagating the idea that there is allegedly evidence of past lives based on recovered memories under hypnosis. This is after decades of scientific debunking of such claims in the West. In the same vein, Chandana Jayaratne, a popularizer of science of the SLAAS, supported the local claim that the ancient Buddhist stupas at Anuradhapura, the largest brick structures in the world, were built by aliens. The map of science in Sri Lanka remains patchy.

Over fifty years ago, Sri Lanka generally solved her problems concerning access to primary education. This is in contrast to India, which decided to forego universal literacy to build a viable S&T system and community. But the educated Indian population has relatively good and efficient access to both Indian and international discussions on scientific knowledge, which feed both their public as well as their S&T practitioners. Indians have broad access to sophisticated discussions on S&T and their social context in Indian newspapers. This is quite in contrast to Sri Lanka, where science has been disseminated locally through the school system and the university structure, albeit sometimes unevenly. A contributing factor has been the shift to local languages as a medium of instruction in the universities. This change has been introduced without adequate translations of pedagogic material into the local languages.

Uninformed intermediaries in the news media often initiate public discussion on S&T related issues. The worst offenders are the state newspapers, a case in point being Sri Lanka's *Sunday Observer*. For example, the major crisis in Sri Lankan public life has been the ethnic strife that has now extended over decades. The newspaper distorts its reporting to suit the ruling ideology. But this situation is changing, due in part to the more positive side of globalization. For example, 'Discovery' programmes are beamed through state channels directly to Sri Lankan homes in the two languages of Sinhala and Tamil. The 'Discovery' package may be Eurocentric and leave out non-Western, and more narrowly Sri Lankan interests, but it helps shed local blinkers.

## CONCLUSION

Sri Lankan S&T capacity can be characterized as relatively developed in areas such as crops research or in applied engineering and medicine. But in other areas, it is patchy. Over the years there has been an increase in funding for research in the physical and chemical sciences. But a major impediment appears to be lack of good ideas and proposals. In the absence of good research proposals, weak proposals are often approved.[10] Weak funding, inadequate local exposure to international and local debates, lack of growth of viable and self-reinforcing sub-communities without continuous accumulation of knowledge characterize many other fields.[11] There is also a tendency among some senior academics to discontinue research once they have been awarded their last promotions.[12] Despite all these drawbacks, S&T in Sri Lanka seems healthy for a middle-level developing country. But from the point of view of the requirements of the country as well as science, this is inadequate. After all, Sri Lanka has life expectancies that match those of developed countries and is well placed with respect to the other quality of life and social indicators.

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# 36.6.3
## SCIENCE AND TECHNOLOGY IN SOUTH-EAST ASIA

*Suzanne Moon*

### INTRODUCTION

In early-twentieth-century South-East Asia, state bureaucracies became crucial players in the spread of science throughout the region. Those governing the colonial and non-colonial states of South-East Asia followed the lead of governments around the world, who saw science as the key to more efficient state management, and to the material and social transformation of their societies.[1] Governments established scientific bureaucracies to inform policy in areas like agriculture, forestry, and health. For the state, scientific methods made it possible to 'see' people and resources in simplified ways, which focused on only those aspects specifically related to state objectives, making manageable the complexity of the real world.[2] For example, scientific foresters characterized forests by board-feet of different woods and estimated yields over time, thereby defining and managing 'timber resources'.[3] In South-East Asia, science offered an efficient way to manage resources, an important goal given that the region relied heavily on raw material production to fill state coffers. States used science to manage populations as well. Anthropological studies of ethnic communities suggested divisions the state could use to organize and control their populations, which in turn popularly reinforced social divisions that had previously been more fluid.[4]

In South-East Asia, scientific bureaucracies started to emerge in the late nineteenth century. The Netherlands East Indies Department of Public Works had become fully managed by technical experts by 1885, and a scientific Department of Agriculture was created in 1905. British Malaya had Departments of Health and Chemistry by the late 1890s and a Department of Agriculture in 1905. The American Philippines started a Bureau of Science in 1912. Thailand, with help from the Rockefeller Foundation, started a medical training school in 1917.[5] Such institutions provided not only a place for science, but also local questions for science to address. In Europe, universities played this role; in South-East Asia there were few universities before 1900. Science in the region had usually been practiced in enclaves, operated by Europeans for their business interests or to further European scientific careers. Private planters' organizations, for example the sugar industry on Java and the rubber industry in Malaya, supported research stations.

Otherwise, Western scientists travelled to the region for field research in areas as diverse as geophysics, astronomy, anthropology and botany.[6] These institutions rarely penetrated local societies; they were neither meant to train local people in great number, nor make science a part of indigenous life.

In contrast, state-supported scientific institutions penetrated more deeply into the life of South-East Asian societies, changing the science and the societies themselves. This was especially true for science practiced for 'development'. 'Development' is a slippery term, but often meant the improvement of the economic life of ordinary people, who were seen by state authorities as lacking the means or motivation to improve their own economic positions.[7] Authorities identified groups of people who did not seem to fit into society as the state thought they should, whether because they lived lives of greater economic and material hardship than others, or because they did not accept the goals set out by the state. Development programmes might, for example, reorient subsistence producers toward cash economies, giving them (in theory, although rarely in practice) more income and the state more tax revenue. Development projects were, like scientific bureaucracies, a global phenomenon. In the United States for example, backers of the 'Country Life Movement' (1908), brought modern technologies to the American countryside in order to stem a worrisome migration to cities. The young Soviet state undertook tractorization and electrification projects in the early 1920s to overcome their self-perceived backwardness.[8] In the eyes of authorities (although the public did not always share their views) such projects were beneficent, promoting the rational exploitation of peoples and places, and justifying the authority of government. In South-East Asia, colonial powers made scientific development projects part of 'civilizing missions' meant to materially demonstrate the wisdom of colonial authority.[9] Thailand embraced science and technology under the rule of Chulalongkorn, to strengthen the Thai state in its confrontation with colonial powers.[10]

Because bureaucracies of development were created to solve local problems, science became a larger part of life in South-East Asia under their influence than when scientific institutions were European enclaves. Development projects often opened some forms of scientific careers to indigenous

people. Laboratories and experiment stations employed indigenous people as technicians, making science dependent on indigenous labour. Better-educated indigenous people became crucial to the success of development, using their training in science and familiarity with local cultures to mediate between laboratory scientists and ordinary people. Participating in science created a worldview among these young elites that separated them from their older counterparts, inculcating a belief in the power of science to solve social problems.[11] These mediators in turn introduced scientific ideas and methodologies to ordinary people through education programmes. The numbers of people who could enter the ranks of the scientifically trained was not high, and the depth to which their work penetrated daily society varied. Nevertheless, the work of such mediators did make science a recognizable part of South-East Asian life in the twentieth century, opening a place, if a small one, for Western-style science in indigenous society. The transition of science from an enclave practice to an integrated part of a South-East Asian society is demonstrated by the case of Indonesia, where the transformation of the enclave of the Royal Botanical Gardens in Buitenzorg (later Bogor) into the Netherlands East Indies Department of Agriculture opened an enduring institutional space for indigenous people to practice science aimed at the needs of local society.

## SCIENCE IN THE NETHERLANDS EAST INDIES: THE TRANSFORMATION OF AN ENCLAVE

In 1900, the Royal Botanical Gardens at Buitenzorg on Java, was a premier scientific institution in South-East Asia.[12] As was typical for botanical gardens in the tropics, the gardens in Buitenzorg were operated as an enclave of European science. The transformation of this enclave came about largely in order to obtain a more secure place for science in the colonial bureaucracy. While focused on botany, the gardens were never run solely as a 'useful' enterprise, or one from which the state expected to reap profits. Initially established in 1817, the gardens were operated at the pleasure of the king and only in 1843 were they incorporated into the bureaucracy of the Netherlands East Indies government. The gardens during these years collected tropical plants and exchanged plant materials with Dutch universities, maintaining a modest scientific profile for the increase of botanical knowledge.[13] The botanical gardens were constantly vulnerable to budget cutbacks because of the charge that their work was not tied to the business of the colony.

This began to change when Melchior Treub took over the post of director in 1880.[14] Treub sought to increase the international prestige of the institution, and give it a solid foothold in colonial administration. In doing so he walked a careful line between maintaining the scientific independence of the gardens and providing useful science for the colony. Before Treub took over, the gardens had experienced a notable success with the cultivation of cinchona trees, the source of quinine, the only known prophylactic for malaria. Some pragmatists insisted that the gardens should be used for discovering and cultivating new plants for export agriculture. Treub had an entirely different vision for making a place for science in colonial administration. He

created laboratories and fields designed especially for experimental plant sciences, like plant physiology, and pathology, entomology, and soil chemistry, contrasting sharply with the older tradition of building collections of tropical plants. By setting up experimental facilities in new areas of research, Treub made the gardens a place from which a scientist could build a reputable career far from Europe, something that was quite difficult to do.[15] While tropical areas had been long recognized as a storehouse of botanical riches, scientists usually collected, rather than analyzed, data there.[16] Scientifically, Treub's facilities supported world-class scientists in their research, adding to the prestige of the Indies. Institutionally, Treub's gardens became a place for the ongoing support of cutting-edge science in the colony.[17]

The prestige of the gardens helped secure them a place in colonial bureaucracy, but did not eliminate their vulnerability. Treub built a stronger case for the gardens by having scientists work voluntarily (but not exclusively) on problems afflicting export crops. Most dramatic were their contributions to understanding the sugar cane disease *sereh*, which had brought Java's sugar industry almost to a standstill in the 1880s.[18] At the same time, Treub ensured the scientific independence of the gardens by vesting the director (himself) with sole authority on scientific matters, freeing the science from any direction by their bureaucratic heads in the Department of Education, Religion and Industry. Treub made the gardens useful without jeopardizing the independent actions of scientists.

Treub reinvented the Botanical Gardens as a premier scientific institution whose agenda was controlled internally, but it remained a European enclave. Indigenous people played none but the lowest-level roles in the institute, doing menial labour in experiment fields or laboratories. Introducing science to the colonized people, even elites, was not part of Treub's vision for colonial science. For educated members of indigenous society, science was not a typical career. The most promising positions were in the Native branch of the civil service and law was the training of choice.[19] This began to change as an indirect result of a set of administrative reforms that came to be known as the Ethical policies. As the government began to call for greater attention to the welfare of indigenous people – or what was called 'the development of the Native peoples' – the possibility of using science for Native development became a popular idea. It was from the spread of scientific Native development that the possibility of scientific careers for indigenous people emerged.

That possibility did not emerge immediately. While the more socially ambitious ethical policies aimed to expand the political role of indigenous people, introduce press freedoms, and encourage Western education for indigenous youth, Native development also included projects meant to improve the material, or economic well-being of the people. Treub argued that the same scientific approach that worked for export agriculture could be applied to indigenous agriculture, and that such work should be done by a comprehensive Department of Agriculture, which would become the sole scientific authority for all agriculture in the colony.[20] Treub based his proposal in part on the United States Department of Agriculture and in part on the existing Botanical Gardens that would be subsumed into the new department. Treub's proposal put science in the service of indigenous agriculture, and also secured a long-term place

for science in the colony, since the department would advise on agriculture, the primary business of the colony. Treub argued that both export crops, which were facing serious international competition, and indigenous crops, which provided a significant portion of the colony's food supply, required the kind of experimental science he had developed at Buitenzorg to make food and export production optimally productive and remunerative.

The debate over whether to form a Department of Agriculture revolved around the question of how useful such a department would be for the indigenous people, and Native development. A few representatives of the civil service argued that scientists would always be serving two masters: their scientific careers and indigenous farmers. How could anyone trust scientists not to put their own careers and the 'interesting' work of science before the needs of the Native peoples?[21] In a related critique, some argued that while the civil service had contact with the people on a regular basis, scientists as a rule did not. How could scientists serve the best interests of farmers when they didn't know the farmers?[22] Treub's gardens had always been a European enclave, his proposal therefore had little to say about just how farmers would access the scientific knowledge he envisioned emerging from his department. Support for the Department far outweighed criticism however, and in 1905 the Minister of the Colonies in the Netherlands approved the creation of the Department of Agriculture with Melchior Treub as its first Director. Treub succeeded in creating a bureaucratically secure place for the practice of science in the colony, but the issue of Native development placed the Department under much more public scrutiny than the Gardens had ever experienced. The questions raised by early critics about the ways the Department would interact with the indigenous peoples would become a central issue that shaped the ways that science was practiced, and who would have the opportunity to practice it, in the East Indies.

## 'CLOSE CONTACT' – THE DEBATES OVER SCIENCE AND NATIVE DEVELOPMENT

Treub organized the new department, including the section for investigations into Native agriculture, much as he had the Botanical Gardens. The emphasis was on scientific experiment and fact-gathering. For example, one of his first actions was to collect samples of all the different kinds of rice grown on Java, and have an investigator catalogue the unique varieties, as a prelude to selecting the most high-yielding varieties for distribution to farmers.[23] Yet the project of Native development posed a problem of dissemination that Treub had not previously faced. When dealing with European planters, Treub faced a small, educated audience who would follow the results of relevant scientific work with little or no prompting. Indigenous farmers differed dramatically. Not only were there far more people involved – agriculture accounted for the livelihoods of greater than 90 per cent of the indigenous population – they had no culturally inculcated faith in science, nor the means to easily follow scientific debates. Nineteenth-century agricultural improvement projects organized by civil servants had usually been ineffective at best, and disastrous at worst as civil servants tried to compel

participation in scientifically questionable projects. Ordinary farmers had little reason to find government representatives credible. Treub opposed compulsion, finding it unjust, ineffective, and for his own work, unnecessary.[24] Treub had a dual approach to solving credibility problems. First, he made sure that experimental work, anything that might provoke incorrect interpretations by non-experts, be done at locations closed to farmers. Public demonstrations would involve only proven technologies. Second, he held demonstrations not for farmers, but for members of the indigenous ruling hierarchy. Treub believed that farmers would take the word of their leaders far more readily than that of Europeans. He used indigenous leaders as intermediaries between the Dutch and the Indies peasants much as Dutch colonial government had done for years.[25] Treub's methods, relying so much on colonial tradition, did not please ethical reformers.

Ethical reformers complained most about Treub's model of dissemination. They wanted fast, almost revolutionary change in indigenous agriculture, reaching further into the countryside than the nine demonstration fields established by Treub could do. One study noted that Java would need nearly 8,000 demonstration fields for it to have proportionally as many as the Netherlands did.[26] The problem was not only quantity, but also method. Ethical reformers were committed to an ideal of the colonizers as tutors for the colonized, promoting 'close contact' between the Dutch and indigenous people, which they believed would produce better social relations in the colony. Treub's system of indirect contact did not satisfy these ideals.

In ill health, Treub resigned in 1909, and was replaced by Herman Lovink, a man whose priorities matched those of Ethical reformers more closely than had Treub's. A Dutch bureaucrat who was not himself a scientist, Lovink had headed the Ministry of Agriculture in the Netherlands and enthusiastically supported the creation of an agricultural extension service in the Indies in 1911.[27] Under Lovink, the department operated far more demonstration sites, and blurred the distinction between experiment and demonstration. Both were run on fields that were open to the public, producing the desired close contact between representatives of the Department of Agriculture and Javanese farmers.

Lovink's initiative played a crucial role in transforming the enclave-like operation of the Department of Agriculture into an institution which supported scientific training and employment for indigenous people. Locally trained indigenous extension specialists became crucial to the working of demonstrations across Java. Lovink did not rely solely on Dutch specialists for two reasons. Pragmatically, it would have been expensive to hire the number of Europeans necessary for the task of extension as Lovink envisioned it. More importantly, Dutch extension specialists, trained primarily in science, were less well-equipped than educated indigenous people to negotiate the cultural and linguistic barriers between colonial scientists and indigenous farmers. Indigenous extension specialists became indispensable mediators between these two groups. Trained in Western science, but raised in indigenous society, these mediators could effectively translate both the language and intent of Western science to indigenous peoples.[28] Extension specialists ran schools for farm children, occasionally designed demonstrations, supervised demonstration fields, and practiced most of the 'close contact', i.e. talking to

farmers and encouraging them to adopt new techniques and materials recommended by the Department. Indigenous extension specialists, while admittedly not at the top of the scientific hierarchy, nonetheless became an essential cog in the project of Native development.

The spread of indigenous scientific mediators had a significant effect on the spread of scientific agriculture, by encouraging changes to practice, and by making the scientific approach more familiar to farmers. Extension specialists in charge of demonstration fields established relationships with farmers, whose land they often used, and explained the purposes and methods of the demonstrations. They also worked in agriculture schools, which often operated small demonstrations, therefore offering to some rural students an introduction to scientific agriculture. Exactly how 'scientific' this education was did change over time. While in the 1910s there was a good deal of emphasis on providing a theoretical understandings of plant biology, by the 1920s officials in the Department revised the training to be more 'pragmatic', focusing on the operation of experiments, and excluding study of the underpinning biological theories.[29] This change limited the wider spread of scientific education, even though students did gain some exposure to scientific methods. There is evidence that by the 1920s indigenous society had started to embrace the promise of science. Leaders in the royal principalities of Yogyakarta and Surakarta organized their own demonstration fields. Some villages made special requests for help in organizing their own demonstrations. One anonymous farmer in the 1920s argued that wealthy farmers should send their children to Europe for agricultural education to bring back the most modern methods.[30]

'Close contact' and the indigenous extension specialists did not just spread scientific thinking, they also made certain kinds of knowledge-production possible. As the extension service began to do demonstrations across Java, they gained a detailed view of the differences in climate, soil, water, and agricultural practice across the island. While some 'demonstrations' were intended to show the superiority of high-yielding seed varieties, extension workers often discovered instead the extent to which regional variations affected the yield of those varieties.[31] What had started as a search for a few high-yielding varieties of rice, became instead an effort to discover which varieties of rice would grow best in which areas. Consequently, demonstrations became experimental, comparatively exploring the outcomes of regimes of seed varieties, fertilizers, irrigation methods, and rotations for particular locales. Later, with the advent of agricultural economics, extension specialists expanded their studies to the economic life of villages, striving to gain a systemic understanding of agriculture, from the composition of soil, to the details of economic behaviour. This detailed scientific view of Java's agricultural landscape would have been impossible without the corps of indigenous and European extension specialists.

Demonstration/experiments done for Native development provided a modest but significant way for farmers' opinions to influence the projects as well. As extension specialists ran comparison tests of rice and other crops, they discovered that indigenous farmers valued – far more than yield – appearance, flavour, speed of ripening, and ease of harvest, for example. While the Department itself continued to espouse the philosophy that yield improvement was the primary goal, extension specialists had to modify that goal on the ground to meet the expectations and habits of farmers. The goals of Native development stayed the same, but its actual results were shaped by farmers' input to the process.

The scientific work of the Department was not lost on indigenous political activists in the Indies, although it did not target this largely urban group of reformers. Many Indonesian activists embraced the promise of science (and some, including Sukarno, the engineer who would become Indonesia's first president, were trained in technical fields). Activists did question however, whether the science was truly being used in the best interest of Indonesians. One critic named Darsono roundly criticized the agricultural extension service for offering advice that was useful only to wealthy farmers.[32] Darsono dismissed farmers who listened to Dutch extension specialists as 'bootlickers', but at the same time endorsed the trustworthiness of Native extension workers. For Darsono, the problem was not the science, but the motivations of those who disseminated it. A similar point was made by one critic who identified himself only as a Realpolitiker in a debate on the subject published in the newspaper *Daulat Ra' jat*. He argued that the Dutch would manipulate any change so that ultimately it did not benefit the people, but the Dutch alone.[33] Nevertheless, both he and his opponent agreed that science would be useful. Realpolitikers, however, argued that this would not happen until after the revolution, when the science was in the hands of Indonesians alone. Revolutionaries by and large saw science as a useful tool if it was independent of colonial control.

## THE LEGACY OF THE NETHERLANDS EAST INDIES DEPARTMENT OF AGRICULTURE

Development projects in the Netherlands East Indies, as in much of the rest of the colonial world, did not achieve a wholesale transformation of indigenous economic life.[34] Yet development work did provide the motivation to transform enclave-like institutions of scientific practice into bureaucratic institutions that reached more deeply into indigenous society. In the Indies, more indigenous people had access to scientific education, and a few were able to pursue scientific careers without going to Europe, something that would have been impossible in the nineteenth century. Most Indonesians, like most Dutch people, began to accept the promise of science as an agent of social change, even when disagreeing on what kind of social change was desirable. When the Republic of Indonesia began to construct its independent government in 1945, it duplicated existing scientific departments such as agriculture, and staffed them largely with those trained during the colonial era. In so doing it gave priority to maintaining the infrastructure of science for development. Although sending many students abroad, and welcoming aid and advice from agencies like the United States Technical Cooperation Administration (later the US Agency for International Development), the new Indonesian Ministry of Agriculture drew significantly on the scientific traditions of the colonial Department of Agriculture. Indeed scientific exchange has remained a prominent way that independent Indonesia has maintained ties to the Netherlands.

Across South-East Asia, science was able to play a deeper role in societies because it gained a stable place within state bureaucracies. These bureaucracies offered scientific careers, and eventually motivated the growth of educational institutions like the Technical University of Bandung in Indonesia, and Chulalongkorn University in Thailand. While this kind of support has allowed far more people to be educated in science than during the early twentieth century, it must be noted that there are still serious obstacles to the pursuit of scientific professions in South-East Asia. In Indonesia for example, higher education is expensive and out of reach for the vast majority of people. The most prestigious science degrees are usually those from foreign universities, placing yet another barrier in the way of the most ambitious students. This being said, the establishment of state bureaucracies did end science as a purely Western enclave and foreign practice. Science in South-East Asia has grown indigenous roots, which continue to inform and transform the Western scientific tradition.

## NOTES

1.  To give just a few examples, the United States had established its Department of Agriculture in 1862, which contained among other sub-departments, a department of chemistry for research into food and drug safety. Scientific forestry emerged as a tool for government in Saxony and Prussia in the late eighteenth century. For an interesting analysis of the importance of such scientific bureaucracies to democratic societies see Y. Ezrahi, *The Descent of Icarus: Science and the Transformation of Contemporary Democracy*, Cambridge, MA, 1990.

2.  J. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*, New Haven, CT, 1998.

3.  Ibid., pp. 11–25.

4.  B. Anderson, *Imagined Communities*, New York, 1991.

5.  P. Donaldson, 'Foreign Intervention in Medical Education: A Case Study of the Rockefeller Foundation's Involvement in a Thai Medical School', *International Journal of Health Services*, Vol. 6, No. 2, 1976.

6.  Lewis Pyenson, *Empire of Reason: Exact Sciences in Indonesia, 1840–1940*, Leiden and New York, 1989. On botany see D. Headrick, *The Tentacles of Progress: Technology Transfer in the Age of Imperialism, 1850–1940*, Oxford, 1988.

7.  For a general treatment of colonial definitions of development as they relate to civilizing missions, see M. Adas, *Machines as the Measure of Men: Science, Technology and Ideologies of Western Dominance*, Ithaca, NY, 1989. Also see Scott, op. cit.

8.  For brief accounts of Russian tractorization, and reorientation of subsistence producers towards monocropping of cash crops, see Scott, op. cit. On the Country Life Movement, see R. Kline, *Consumers in the Country: Technology and Social Change in Rural America*, Baltimore, MD, 2000. For Soviet electrification see J. Coopersmith, *The Electrification of Russia, 1880–1926*, Ithaca, NY, 1992.

9.  Adas, op. cit.

10.  I. Hodges, 'Western Science in Siam: A Tale of Two Kings', *OSIRIS*, Vol. 13, 1998.

11.  For more on the significance of young elites for emerging nationalist movements see B. Anderson, op. cit.

12.  Headrick, op. cit. While somewhat hagiographic, H. H. Zeijlstra, *Melchior Treub: Pioneer of a New Era in the History of the Malay Archipelago*, Amsterdam, 1959, provides useful information about the achievements of the Botanical Gardens under the direction of Melchior Treub. For a general history of Indonesia during this time period see M. Ricklefs, *A History of Modern Indonesia since c. 1300*, Stanford, CA, 1993.

13.  A. Goss, 'Desk Science: Managing Biology in the Netherlands East Indies, 1880–1910', Presented at the History of Science Society annual meeting, Milwaukee, WI, 2002.

14.  Zeijlstra, M. Treub, A. Goss, 'Desk Science: Managing Biology in the Netherlands East Indies, 1880–1910'.

15.  A. Goss, op. cit., see also Pyenson, op. cit.

16.  One of the most famous examples is that of Alfred Russell Wallace, who spent a great deal of time collecting specimens in the Malay Archipelago for himself and for sale to other scientists and collectors.

17.  I am indebted to Andrew Goss for this insight.

18.  For a contemporary discussion of research into sereh disease see F. Benecke, *Sereh: Onderzoekingen en Beschouwingen over Oorzaken en Middelen*, Semarang, 1892–93.

19.  H. Sutherland, *The Making of a Bureaucratic Elite: The Colonial Transformation of the Javanese Priyayi*, Singapore, 1979.

20.  M. Treub, *Schematische Nota over de Oprichting van een Agricultuur-Departement in Nederlandsch-Indië*, Buitenzorg, 1902.

21.  J. S. van Braam, *Een Landbouwdepartement in Indië*, Batavia, 1903.

22.  Ibid., p. 36.

23.  See reports in J. E. van der Stok, 'Onderzoekingen omtrent Rijst en Tweede Gewassen', *Mededeelingen uitgaande van het Departement van Landbouw*, No. 12, Batavia 1910, and also a briefer reference to initial efforts in *Jaarboek van het Departement van Landbouw in Nederlandsch-Indië*, Batavia, 1907, pp. 102–3, and 1908, pp. 342–44.

24.  C. J. Hasselman quotes Treub on this subject in 'Varia', *Het Tijdschrift voor het Binnenlands Bestuur*, Batavia, 1904, p. 65.

25.  For more on 'indirect rule' see J. S. Furnivall, *Netherlands India: A Study of a Plural Economy*, New York, 1944.

26.  *Onderzoek naar de Mindere Welvaart der Inlandsche Bevolking op Java en Madoera*, Batavia, 1905, Vol. 5a, p. 311.

27.  For Lovink's views on the importance of 'close contact' see Nota from Director-General (H. J. Lovink) of the Ministry of Agriculture to Minister of the Colonies, 29 July 1909, No. 12, Algemeen Rijksarchief, The Hague, The Netherlands.

28.  On Java, people might speak Javanese, Sundanese or Madurese as their first language, with Bahasa Melayu as a common second language (which later evolved into Bahasa Indonesia, currently the national language of the Republic of Indonesia). While scientists, like other expatriates would usually pick up some knowledge of one or more of these languages on the ground, they rarely received any formal training. For a fascinating look at Javanese culture and traditions see S. Kartodirdjo, *Modern Indonesia: Tradition and Transformation*, Yogyakarta, 1988.

29.   See the report by T. J. Lekkerkerker in *Jaarboek van het Landbouw, Nijverheid, en Handel*, 1920, Weltevreden, 1920, pp. 93–95.

30.   *Perdata*, 15 June 1926, pp. 47–49.

31.   For examples of such work see the reports of the Madiun/Kediri district in the *Verslag Landbouwvoorlichtingsdienst*, Weltevreden, 1912–1914.

32.   Darsono, 'Giftige Waarheidspijlen: Landbouw en Veeltelt', *Sinar Hindia*, 15 May 1918.

33.   See an exchange debating this topic in the newspaper *Daulat Ra'jat*: Realpolitiker, 'Sekedar Tentang Soal Tani', *Daulat Ra'jat*, 30 March 1933, Abikoesno Tjokrosoejoso, 'Sekedar Tentang Soal Tani', *Daulat Ra'jat*, 10 April 1933, Realpolitker, 'Djawaban dari Realpolitker', *Daulat Ra'jat*, 10 April 1933. Because this paper was edited by Mohammed Hatta, who eventually became the first vice-president of Indonesia, it is entirely possible that Hatta himself was 'Realpolitiker'.

34.   For more on the complexities of economic change in Indonesia see Peter Boomgaard, *Children of the Colonial State: Population Growth and Economic Development in Java, 1795–1880*, Amsterdam, 1989, and Anne Booth, *The Indonesian Economy in the Nineteenth and Twentieth Centuries: A History of Missed Opportunities*, New York, 1998.

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# 36.7
## CONCLUSION

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By the middle decades of the twentieth century, most parts of South and South-East Asia were endowed with institutions of scientific and technological research. Researchers working at these institutions had joined a global scientific community with socio-intellectual ties extending over long distances. At the end of the twentieth century it then became pertinent to ask how these institutions were functioning in comparison with institutes in the developed world. How much had the societies of these regions benefited from science? In other words how much of the rhetorical promise of science was transformed into public good. And finally, what was the impact of scientific research undertaken in the region on world science?

As will be evident from the preceding articles, it appears that in certain areas of the sciences the institutions of research in different nations of the South and South-East Asian region have made a notable impact in the world of science. Further, depending on the resource endowment of the region, a degree of specialization has been achieved through institutions that have dedicated themselves to focused research, and through ties with the related strategic industrial networks of the area. While India appears to have benefited the most in terms of its dense network of institutions, it still appears to have a long distance to traverse in terms of making a significant mark in terms of impact indicators.

A study undertaken by Thomas Schott on the nature of ties between the centres of science in the United States and the rest of the world has some interesting insights to offer.[1] The study suggests that the globalization of science is not identical with the process of equalization. Sociologists of science have posed the question whether science lives up to the promise of being a public good, and if it does, for whom.[2] Science becomes a public good when the necessary infrastructure, research training, material and cultural facilities are simultaneously available, in order to render the entire system capable of participating as equal partners in the generation of scientific knowledge. The fact that the resources for scientific and technological research in the two regions are available but are spread out thinly has generated few institutes of excellence that manage to keep pace with developments at the international research front, or with cutting-edge research, or world-class research.[3] Other than

these islands of excellence, as in the period of colonial rule, the system of world science crystallizes into a centre-periphery formation. This has meant that while the periphery produces people who fit into research positions at the centres of science, the ideas themselves migrate from the centre to the periphery and influence research and research priorities at the periphery.[4]

If one takes the case of the South Asian region, no scientist has received the Nobel Prize in the sciences since 1933. During the postcolonial period three scientists who received their early education in the region, but who pursued their scientific careers in the West, were awarded the Nobel Prize: two for physics and one for medicine. This itself is an indicator of the difficulties encountered in pursuing science at the periphery and the constraints posed by the politicization of Big Science. We would like to mention two important findings that have come out of Schott's survey. A study of the nature of collaboration between the different regions of the world indicated that collaboration between institutions within a country has not grown as rapidly as foreign collaboration; and this is particularly true of the developing regions of the world. As a consequence, it appears that long-distance ties between scientists have grown much faster than ties between scientists of neighbouring nations.[5]

The concentration of research resources in institutes dedicated solely to research is reflected in the gradual displacement of the university as the primary site of knowledge production. Scientometric studies undertaken in India reveal that in the more advanced areas of scientific and technological research, the major contributions to scientific research come from the research institutes.[6] The universities still manage to hold the line in a few traditional research areas. This breakdown of the Humboldtian model of the university in the region has consequences whose impact still needs deciphering. Simultaneously, governments have been pressuring ministries and agencies of science and technology to restructure both organizationally and in terms of research priorities. This has many implications for research practices, research budgets and research priorities.

While these changes and pressures are manifest in most regions of the world, they acquire a crucial significance where

research systems have just begun to acquire stability, and in environments where they are suboptimal. But more than anything else this structural crisis has resulted in the marginalization of the social agenda due to science within policy discourse on science. The crisis due to the dysfunction of the scientific and technological research system in the 1970s generated an entire debate on 'relevant research' from within the scientific community.[7] The rhetoric of legitimation and the policy environment of science today reveal axiomatic differences, wherein the social contract of science is being drafted differently. Furthermore, the changing geopolitical scenario of the region has resulted in the reallocation of budgets towards research in security- and defence-related areas. Put another way, there are more resources available under the umbrella of defence-related research. These developments strain resources that could well be committed to the developmental requirements of South Asia. India and Pakistan have demonstrated nuclear capabilities, exacerbating the proliferation of nuclear weapons capabilities and the threat of nuclear war in the region. This is not to suggest that broad fronts of scientists and citizens across the border have not been campaigning for nuclear disarmament.

However, globalization has also opened new windows and opportunities in the information and biotechnology sectors. The region is able to produce a sufficient number of graduate students who can take up jobs to meet the demand of the information and biotechnology industrial sectors in the West. This has produced large-scale migration of graduate engineers and scientists from the South Asian region to the West. Furthermore, over the last couple of years some leading infotech giants from the United States have commenced shifting their R&D facilities to India particularly. While this is an indication of the pace and dimensions of globalization, it is too early to tell which of the two processes, the relocation of R&D facilities or the large-scale migration of trained technical professionals,

prevails. Leading institutes of technology and scientific research in India have worked out arrangements with universities and polytechnics in Europe for exchanging students and the pursuit of doctoral degrees abroad. This continues to pump the universities of the West, where doctoral enrolments are declining, with fresh blood. Hopefully, this exchange would also endow the institutes of these regions with infrastructure and integrate them more strongly into networks of 'cutting-edge research.' The next few decades will reveal whether these regions have entered the world of global science as equal partners.

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# EAST ASIA

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## INTRODUCTION

East Asia entered the twentieth century through two wars: the First Sino-Japanese War, from 1894 to 1895 and the Russo-Japanese War, from 1904 to 1905. Although these two wars were related, they had different meanings and impacts. In the pre-modern period, China was the pre-eminent power in East Asia, and regional politics revolved around the Qing Dynasty, the last Imperial Manchurian dynasty to rule (1644–1911). This was an isolated system and had little contact with international systems in the other regions. The nineteenth century Opium Wars between China and Britain (1839–42, 1856–60) were the first ever assault from Western capitalism on the established system. The First Sino-Japanese War symbolized the total collapse of this system: China's last tributary state, Korea, now severed its former relationship and came under Japan's sphere of influence. Japanese military power, which had been developing since the Meiji Restoration in 1878, now exerted itself across the Asian continent. Japan defeated the corrupt and decaying Qing Government. The Western powers, however, still did not recognize that Japan was an equal player on the international stage. The Russo-Japanese War was a war for supremacy in East Asia, and Russia's loss enabled Japan to establish itself as an equal with Western powers. Britain, France and Germany had their own spheres of influence in the Asian continent, and they could do little in Northeast Asia. In spite of the Open Door Doctrine put forward by US Secretary of State John Hay in 1899, the United States was not in a position to compete with Japan in the region, and its major concern was to consolidate its position in the Philippines. Because of that, the United States made concession after concession to Japan during the first two decades of the twentieth century, allowing Japan first to take Korea as its protectorate, then to formally annex it in 1910, thus beginning its half century of colonial rule there.

The Boxer Rebellion in China at the very end of the nineteenth century was the last major confrontation between the Late Qing China and the Western powers and expedited the collapse of the feudal Qing rule. Dr. Sun Yat-sen successfully led the Revolution of 1911 in Southern China and established the Republic of China. But the situation was far from stable. With support from the foreign powers, General Yuan Shikai, who used to work for the Qing Dynasty, usurped the power. Yuan Shikai was dreaming of restoring the imperial system and tried hard to get foreign support. Japan was eager to turn China into its actual protectorate and took this opportunity to present the infamous Twenty-one Demands to Yuan's government. Both Yuan's shameless drive for emperorship and Japan's Twenty-one Demands aroused public indignation throughout China, and Yuan's dream was shattered. He died in 1916.

After Yuan's death nobody could control the Northern warlords, and China entered a period of internecine wars that were complicated by the foreign powers' competing for influence and supporting different warlords: Japan backed the Northeast and Anhui warlords, and America and Britain backed the Hebei warlords.

During the First World War the Western powers were busy in Europe and could not spare much attention in China. Using this opportunity Japan sent troops and occupied the leased territory of Germany in Jiaozhou (Qingdao) and the Jiaozhou to Jinan railway. At the Versailles Peace Conference in 1919, the Chinese delegates requested the return of the rights and interests seized by Japan during the First World War in Shandong province. The Western powers, for different reasons, supported the Japanese demands. The Chinese people's indignation erupted violently and the students in Beijing and everywhere held demonstrations, followed by workers' protests. This was the May Fourth Movement, which had profound significance in modern Chinese history. Backed by the Chinese people, the Chinese delegates to the Versailles Peace Conference refused to sign the treaty with Germany and said a loud 'No' to foreign powers for the first time in modern Chinese history.

The Versailles Peace Conference did not solve the outstanding issues between China and Japan and the situation in East Asia remained disturbing. After the end of the First World War the Western powers were eager to return to Asia and could no longer tolerate the Japanese expansion there. In 1922 at the Washington Conference on disarmament, the so-called Nine Power Treaty was concluded and Japan's aggression against China was checked. China returned to sharing its dominance with foreign powers.

The First World War made the Chinese intelligentsia disenchanted with capitalism, and Marxism as a new theory and world outlook spread rapidly. The Communist Party of China (CPC) was established in 1921.

Dr. Sun Yat-sen established his revolutionary base in Southern China and waged a tenacious struggle against the Northern warlords, but he suffered setback after setback. The bitter experience led him to believe that without support and cooperation of the Soviet Union and the CPC he would not prevail. He advocated 'uniting with CPC, uniting with the Soviet Union and supporting workers and peasants'. Having devoted all his wisdom and energy to the cause of the Chinese revolution, he passed away in 1925.

Cooperation between the Kuomintang (KMT) and the CPC changed the nature of the Chinese revolution and greatly expedited its process. In 1926 and 1927 the revolution won a significant victory in its struggle against Northern warlords. In April 1927 Chiang Kai-shek, who possessed military power, launched a coup d'etat, expelled the Communists, and put down the peasants and workers' movement. In 1927 he set up the Nationalist government in Nanjing. Between 1927 and 1937, before the outbreak of the War of Resistance against Japan, or the Second Sino-Japanese War, the Nationalist government achieved considerable success in promoting China's economic recovery and development.

The CPC's countermeasure was to stage the Nanchang Uprising in August 1927 and set up its headquarters in the Jinggangshan Mountain. Thus began the Civil War between the KMT and CPC, which lasted for ten years. Facing encirclement by the KMT, the CPC carried out a grand strategic transfer and completed the Long March during 1935 and 1936. The revolutionary base area moved to Northern Shan'xi province.

Japan was unsatisfied with the arrangement reached at the Washington Conference, and seizing the opportunity provided by the economic crises throughout the world in the late 1920s and early 1930s, conspired to attack the Chinese in 1931 in an assault known as the Manchurian Incident (18 September Incident). The Nationalist government's non-resistance policy and Western powers' weak response further emboldened the Japanese aggressors, and they rapidly occupied the whole of Northeast China. The US Secretary of State Henry Stimson sent a note to Japan announcing that the United States would not recognize the legitimacy of this change of situation nor any treaties and agreements between Japan and China which ran counter to the Open Door Doctrine.

Japan was not satisfied with its success and engineered the Marco Polo Bridge Incident (Lugouqiao Incident) in July 1937. In its aftermath Japan launched a full-scale war against China. Facing the danger of national subjugation, the KMT and CPC both realized the need to cooperate and thus began the War of Resistance against Japan.

Japan's purpose was to dominate the whole of East Asia and eliminate Western influence from the region. On 7 December 1941 Japan made a sneak attack on the US naval base at Pearl Harbor in Hawaii and the British colonies in Asia. The United States proclaimed war on Japan, and the battle for the Pacific began. In November 1943 the leaders of the United States, Great Britain and China met in Cairo and discussed the war against Japan. The Cairo Declaration, which was released on 1 December, solemnly announced that all the territories stolen by Japan from China, including Taiwan and the Northeast, would be returned to China after the Allied Forces won the victory over Japan. In February 1945 the leaders of the United States, Great Britain and the Soviet Union gathered again, this time in Yalta, and concluded several agreements about the Far East. The Soviet Union would join the war against Japan soon after the victory over Germany with the condition that all the rights and privileges lost to Japan in the Russo-Japanese War would be returned to the Soviet Union. Actually, the United States and the Soviet Union divided their spheres of influence in China with the Great Wall as the line of demarcation: the southern part belonged to the US, while the northern part to the Soviet Union. In August 1945 the US dropped two nuclear bombs on Japan over Hiroshima and Nagasaki. On 15 August 1945, the Japanese emperor announced unconditional surrender. On 3 September 1945, General MacArthur accepted the formal surrender of the Japanese on the deck of the battleship *Missouri* in Tokyo, symbolizing the end of the Second World War.

With the end of the war, the struggle between the KMT and CPC for the right to accept the Japanese surrender intensified. In order to avoid the civil war in China and US involvement in the civil war, US President Harry S. Truman sent General George C. Marshall to China to mediate the KMT-CPC conflict. The hatred between the two parties, however, was so deep-rooted, that the mediation failed and the civil war broke out in mid-1946. In spite of US support to the KMT in the civil war, the KMT suffered disastrous setbacks, and in October 1949 the People's Republic of China was established. Chiang Kai-shek with his defeated troops fled to Taiwan.

After the end of the Second World War, Korea was liberated from Japanese rule. According to the arrangement made by the United States and the Soviet Union, Korea was divided into two parts with the thirty-eighth parallel as the demarcation line. After the CPC won, Kim Il-sung was eager to consolidate the revolution and unify the two Koreas. And on 25 June 1950, the civil war in Korea broke out. Unprepared and disadvantaged in military equipment, the South Koreans retreated in defeat. However, UN troops, led by US General Douglas MacArthur, intervened and succeeded in landing at Inchon in mid-September. The North Koreans, forced to turn from the offensive to the defensive, began to disperse. China repeatedly warned that if the UN troops crossed the thirty-eighth parallel, China would not sit idly by. But MacArthur disregarded this threat and crossed the line in October. On 26 October 1950, the Chinese 'volunteers' army crossed the Yalu River and stopped the UN offensive. After three years of difficult and intensive negotiations the four parties (North and South Korea, China and the United States) signed the armistice agreement. Soon after that the

Chinese volunteers withdrew from North Korea, while the UN troops stayed on. Since the North-South Summit of June 2000, following 50 years of stand-off, a new 'Sunshine policy' has brought a thaw to relations between the two countries. It will take time, but relations should eventually be normalized.

The civil war in China seriously influenced the US policy towards Japan. The US policy makers envisioned an Asia policy based on close cooperation with the KMT government. But the defeat of the KMT in China's civil war made this outcome impossible and at the end of 1948 US policy towards Japan underwent a major transformation that moved from destroying a hostile country into building an ally. In 1947 the so-called Peace Constitution of Japan was passed. In August 1951 the peace conference was convened in San Francisco and the United States concluded a Peace Treaty with Japan without the participation of either the Soviet Union or the People's Republic of China. At the same time the US-Japan Security Treaty was also concluded, and Japan became the United States' major ally in East Asia. The Japanese Government used that alliance to implement a policy of relying on the US for security and concentrating instead on economic recovery, which produced a remarkable result. In the 1960s and 1970s Japan became the second-largest economy in the world. The Republic of Korea, too, witnessed remarkable economic development, and some companies, like Samsung and Hyundai, gained a global reputation.

China was quite successful in its economic recovery and implementation of the first five-year plan from 1953 to 1957. Mao Zedong, however, was not satisfied with the Soviet model of development and tried to develop faster. He launched a movement called the 'great leap forward' and organized peoples' communes in the rural area. The experiment was a total failure and the country's economy was seriously hurt. This, combined with natural disasters, led to widespread famine across the country during the early 1960s, especially in rural areas.

Although China and the Soviet Union became allies in the early 1950s, differences began to emerge, and soon after Stalin's death in 1953 the differences became increasingly evident and serious; by the end there was an open rift between the two communist giants. Mao Zedong launched the so-called Great Proletarian Cultural Revolution in 1966. Lin Biao, his long-time comrade in arms, and his wife Jiang Qing took this opportunity to create chaos and disturbance across the country, and paralyzed the nation's economy. Premier Zhou Enlai, being in a very difficult situation, tried his best to save the economy and avoid splitting the country.

The deterioration of Sino-Soviet relations reached a point at the end of the 1960s when China regarded the Soviet Union as the major threat to its security. Meanwhile the United States felt that Soviet expansion posed a serious challenge to its position in the Third World. The United States also felt an urgent need to disengage from the Viet Nam War, which was consuming enormous human and material resources and causing anti-war movements across the country. In February 1972 President Nixon visited China, breaking the thick ice in bilateral relations and changing forever the Cold War geopolitical landscape. Under the influence of Nixon's visit, China and Japan established diplomatic relations in 1974. The agreement opened a new era in the history of the bilateral relations, but

did not completely overcome the historical burden inherited by the two countries.

In 1976, Zhou Enlai, Zhu De and Mao Zedong passed away, one after the other. The party secretary Hua Guofeng, with support of the veterans, was able to suppress the so-called Gang of Four and the Cultural Revolution, which lasted for ten years and brought catastrophe to the country. A number of veterans, who were overthrown during the Cultural Revolution, were now rehabilitated, including Deng Xiaoping.

With his profound strategic vision and courage, Deng Xiaoping launched reform and openness at the end of the 1970s, and normalized diplomatic relations with the United States. It was not a coincidence that the two great events took place at the same time. It meant a change of China's national goal. Before China was a revolutionary country; its goal during the 1960s and 1970s was to launch the world revolution. After the third plenary of the Eleventh Party Congress at the end of 1978, China's national goal was to develop into a modern country and to improve peoples' living standards. Diplomatically, China insisted on an independent foreign policy for peace and developing friendly relations with all countries regardless of their social system and ideology. Starting from 1979 China began the rapid economic growth that Japan had experienced, and has now become one of the economic locomotives in the region.

In 1984 China and Britain concluded the agreement on Hong Kong's return to China after difficult negotiations. On 1 July 1997, China resumed its right to govern Hong Kong. Following Hong Kong's example Macao was also handed over to China in December 1999. Both Hong Kong and Macao are special administrative zones, and the concept of 'one country, two systems' has been applied. Since their return to mainland China, stability and prosperity has been preserved in both Hong Kong and Macao with firm support from the central government.

Since the late 1970s the situation in the Taiwan Strait has been greatly relaxed. The Chinese government has pursued a policy of peaceful reunification and promoted economic, cultural and personal exchanges between the two sides of the Strait. In Taiwan, separatist forces began to develop and with establishment of the Democratic Progressive Party in 1986 the reunification of China has been seriously challenged there.

Czarist Russia collapsed in 1917, and all nationalities in Central Asia launched uprisings in the hope of eliminating ethnic discrimination and oppression. After the October Revolution, soviet regimes were established throughout the region, becoming a part of the Soviet Union. The government of the Soviet Union helped the different nationalities of the Central Asian region to develop, while they made their own contributions to the prosperity of the country. The big problem was that the Soviet Union made every republic a single-product economy so that the central government could control the economies and planning in each republic. A policy of 'Russianization' was also implemented. In spite of this, Central Asia still achieved much during the Soviet period and was basically lifted out of economic and cultural backwardness. After the disintegration of the Soviet Union in 1991 new independent countries were established in the region. But they are still new countries, and are undergoing a difficult period of social transformation.

# CHINA

China once boasted of its brilliant ancient culture and scientific achievements. But it lagged behind after the rise of the West in the seventeenth century. After the Opium War from 1840 to 1842, Chinese intelligentsia turned to the West to save the nation (the so-called Westernization Movement). Again, China was defeated in the 1894 war with Japan. The Chinese intelligentsia regarded defeat as a national shame and came to understand that the nation could not be saved without reforms. They established societies and popularized new forms of knowledge, accelerating the process of learning from Western social systems and culture. Yan Fu translated Thomas Henry Huxley's *Evolution and Ethics* and other essays, Adam Smith's *The Nature and Causes of the Wealth of Nations* and Herbert Spencer's *System of Synthetic Philosophy* into Chinese. Henry Huxley's work, in particular, served as a major shock to the Chinese community of thinkers. Influenced by those works, China's progressive intellectuals with Kang Youwei, Liang Qichao and Tan Sitong as their representatives launched the Reform Movement in 1898, but failed. However, the Qing Court assimilated some of the points raised by them in its 'New Deal' in the last decade of the dynasty.

Traditional Chinese education took Confucian classics as its major content and imperial civil service examination as its end-point. In 1901, the Qing Court shut down the imperial civil examinations and decided to establish a national administration of education in 1905. As a result, the new schools devoted to teaching modern science and technology mushroomed and a growing number of young people went to study in Japan, Europe and the United States. A new breed of intelligentsia with modern political ideas and scientific knowledge was born and new revolutionary leaders arose. Dr. Sun Yat-sen established a revolutionary organization called Tung Meng Hui and proposed the Three Principles of the People (nationalism, democracy and people's livelihood) in 1905. His followers launched the 1911 Revolution and overthrew the Qing Dynasty. This marked the end of the imperial autocratic rule that had lasted for two thousand years in China and with it the pigtails – those symbols of Qing Court service worn by Chinese men – were gone. In the meantime, such bad habits as binding women's feet were officially forbidden.

## The May Fourth Movement

Yuan Shikai, a warlord, usurped the power after the 1911 Revolution and advocated respect for Confucianism and restoration of the ancient practices. However, the new breed of intelligentsia trained in modern education was growing in number and strength and the waves of new ideas and new culture proved irresistible. Chen Duxiu and some others launched the journal of *New Youth* in 1915. The journal radically criticized the backward aspects of traditional Chinese culture, raised the slogans of democracy and science, opposed some classical Chinese writings and advocated writings and literature in the vernacular. It became the flag bearer of the new cultural movement of the time. The May Fourth Movement broke out in 1919 and the Chinese intelligentsia were again awakened in the greatest wave of emancipation of the mind in modern China. After the May Fourth Movement Western ideas flowed into China with even greater intensity. Some of the liberal intelligentsia, headed by Hu Shi, were bent on the ideas of John Dewey and Bertrand Russell, and another group of radical intellectuals, headed by Chen Duxiu, Li Dazhao and Mao Zedong, who were influenced by the Russian October Revolution, became devoted to Marxism. The latter, aided by the Communist International, established the Chinese Communist Party in 1921, while the former, criticized by both the Kuomintang and the Communists, never managed to become part of China's mainstream ideas.

The new cultural movement produced a number of historical results. Lu Xun published his story *A Madman's Diary* in 1918, the first story written in the vernacular in the history of new Chinese literature. He went on to write *Kong Yiji, Medicine* and *New Year's Sacrifices. The Authentic Biography of Ah Q*, who tried to comfort himself spiritually even though he was humiliated, became an immortal artistic model. In his later years, Lu Xun mainly devoted himself to writing essays that are critical of the social evils of the day; with penetrating insight and humour he stabbed at the heart of the old society. Like Lu Xun, Guo Moruo was another talented giant of literary versatility. His contribution was mainly in the field of the new verse. He published in 1921 his collection of verses *The Goddess*, which seeks the emancipation of personality, and sings of youth and strength with a poetic zeal that knows no bounds. It is, indeed, the epitome of the spirit of the May Fourth Movement. After Guo Moruo came such poets as Wen Yiduo, Xu Zhimo and Ai Qing.

In January 1921, Shen Yanbing (Mao Dun), Ye Shengtao and Zheng Zhenduo established the Society of Literary Study, which advocated realism. In July of the same year, Guo Moruo and Yu Dafu set up the Society of Creation, which advocated romanticism, followed by the New Moon Society founded by Wen Yiduo and Xu Zhimuo and the Yusi Society by Lu Xun, Zhou Zuoren and Lin Yutang. A proletarian literary movement came into being in the areas ruled by the Kuomintang in 1928. The Chinese League of Leftist Writers was founded in March 1930. Among the leftist writers, Mao Dun was a great novelist. His novel *Midnight*, describing the complex contradictions and struggles in Chinese society in the 1930s, is an important landmark in the history of Chinese literature. Among the non-leftist writers, Lao She's *Rickshaw* unfolds a picture of the life of the common folk in Beijing. In his novel *The Family*, Ba Jin, with heart-stirring artistic appeal, accused the traditional family of ruining the young. Other well-known writers of the period of the Republic of China were Ye Shengtao, Shen Congwen and Qian Zhongshu.

Films and drama were new forms of art introduced from the West. China shot its first feature movie in 1913. Ouyang Yuqian, Hong Shen, Cao Yu and Chen Baichen were the most important playwrights. The highest achievement was marked by Cao Yu's tragedies entitled *The Thunderstorm* and *The Sunrise*. As plays and films took hold, traditional Chinese operas developed the basis of a rich dramatic heritage, featuring such masters as Mei Lanfang, Zhou Xinfang and Cheng Yanqiu. Mei Lanfang developed the singing and performing art of the female role, forming a unique school in the Peking Opera.

Music and painting developed too during the period of the Republic of China. 'The March of the Volunteers', composed by Nie Er with Tian Han's verse, which reflected the strong will of the Chinese people for national salvation and survival, became the national anthem of the People's Republic of China after its establishment in 1949. 'The Yellow River Cantata', composed by Xian Xinghai with Guang Weiran's verse, and He Luding's 'The Song of the Guerrillas', which sang of the iron determination of the Chinese and their confidence in the final victory over the Japanese invaders, were famous songs during the period of the War of Resistance against Japanese Aggression. Wang Luobin went to Northwest China and collected or composed himself such songs as 'In That Remote Place', full of local national flavour. Xu Beihong and Liu Haisu introduced into China Western painting techniques and reformed the traditional painting. Xu Beihong was particularly good at painting horses. Liu Haisu showed his virtuosity in landscape painting, and was dubbed 'the Lion of the East'. In traditional painting, Huang Binhong and Zhang Daqian were particularly good at landscape painting, while Qi Baishi excelled in painting figures, landscapes, flowers and birds. Qi Baishi advocated 'similarity and yet non-similarity with the real objects'. With a few simple strokes, he might wonderfully bring to life a single crab or several shrimps.

After the May Fourth Movement in 1919, Marxism spread to all corners of China. Li Da's *Outlines of Sociology* (1936) expounded the basic views of dialectical materialism and historical materialism. Mao Zedong proposed integration of Marxism with revolutionary practice in China. He finished *On Practice* and *On Contradiction* in 1937 in Yan'an. They exposed the relations between man's cognition and practice and the law of the unity of opposites in the objective world. These writings became the philosophical foundation of Mao Zedong's thought.

After the outbreak of the War of Resistance against Japanese Aggression, intellectuals in large groups went to Yan'an. Mao Zedong called a forum on literature and art in 1942, urging them to serve the workers, peasants and soldiers. Mao's speech at the forum exercised great influence upon the development of modern Chinese culture. Under its impact, a number of works with entirely new styles came into being such as the opera *The White-Haired Girl*, the epic *Wang Gui and Li Xiangxiang*, and the novels *The Storms* and *The Sun Shines over Sanggan River*.

After the establishment of the Nationalist Government in Nanjing in 1927, education made some headway. Besides regular education, Huang Yanpei established the China Vocational Educational Society. Tao Xingzhi advocated learning through practice and set up work-study groups. Yan Yangchu advocated popular education and established an experimental area to try out his ideas in Dingxian, Hebei province, with some success.

The development of modern China's ideas and culture was also manifested in the development of the educational system. During the late Qing Dynasty, the school system was copied from the Japanese one, which was itself derivative of the French and German systems. In 1922, the Ministry of Education worked out its draft plan for reform of the school system, which instituted the American system of six years for elementary, three years each for junior and senior high school and four years for university education. Three kinds of schools – middle schools, normal schools and vocational schools – were established.

Missionaries were the earliest disseminators of modern natural science in China. During the Westernization Movement, Li Shanlan and some other Chinese scholars translated dozens of Western scientific and technical works. Ren Hongjuan, Yang Quan, Zhao Yuanren and Bing Zhi, Chinese students at Cornell University, launched the Chinese Society of Science in June of 1914. By January of the next year, they were publishing the journal *Science* in Shanghai. The society moved to China in 1918. Under its impact, Chinese societies of engineering, chemistry, chemical engineering, physics, biology, botany and zoology were established. The Nanjing Nationalist Government established the Academia Sinica and the Beijing Academy as the national-level institutions of research, in 1928 and 1929 respectively.

Geology was the science that registered the greatest results during this period. The most outstanding geologists were Ding Wenjiang, Weng Wenhao and Li Siguang. Ding Wenjiang made outstanding contributions through his work on the geological structures and minerals in Yunnan and Guizhou. Weng proposed for the first time that during the Jurassic and Cretaceous periods of the Mesozoic Era there appeared large-scale orogeny. Li Siguang won great honours with his studies of palaeontology, the Quaternary glaciers and the East Asian geological structures. He published in 1939 in London *Chinese Geology*, which drew wide international acclaim.

Gratifying results were also achieved in the field of biology. The Institute of Biology of the Chinese Society of Science was set up in Nanjing in 1922. Hu Xiansu did major work in gathering and classifying Chinese plant specimens. *The Atlas of Chinese Plant Life*, which he co-authored, became a classic in Chinese biology.

Such scientists as Ye Qisun, Wu Youxun, Zhou Peiyuan, Chen Jiangong, Hua Luogeng and Su Buqing made contributions either in physics or in mathematics. Zhou Peiyuan worked under the guidance of Einstein and contributed to the development of the theory of relativity and gravitation as well as the theory of the cosmos. Chen Jiangong distinguished himself in trigonometric theory of numbers, Hua Luogeng in the theory of numbers and Su Buqing in geometry. Zhu Kezhen made gratifying achievements in meteorology, Zhan Tianyou in railway engineering, Hou Depang in the manufacture of soda ash, and Mao Yisheng in bridge engineering.

Archaeological studies were first undertaken by foreign scholars. In 1906, M. A. Stein, a Briton, discovered bamboo slips dating from the Han Dynasty of 200 BC in Xinjiang. The following year a large amount of scrolls inscribed by people of the Tang Dynasty (AD 618–907) were found in the Mogao Grottoes of Dunhuang. Special studies were undertaken on the basis of the two discoveries. Johan Gunnar Andersson, a Swede and consultant to the Beijing Institute of Geology, discovered the painted-pottery culture of the New Stone Age in Yangshao Village, Henan Province in 1921. Pei Wenzhong discovered in 1929 the skeleton of the apeman Beijing Man, who lived 400,000 or 500,000 years ago, in Zhoukoudian, Beijing. In 1928, large-scale work was launched to excavate the ruins of the Shang Dynasty (sixteenth to eleventh century BC) in Anyang of Henan, and large numbers of inscribed bones and tortoise shells of the Shang Dynasty had been found by 1937. Wang Guowei, Dong Zuobing and Guo Moruo studied ancient Chinese history as interpreted through these inscriptions, with great success.

## The People's Republic of China

The founding of the People's Republic of China in October of 1949 marked the beginning of an entirely new stage in Chinese history. Science, education and culture made initial headway, however, there were many twists and turns. There were repeated movements of ideological and cultural repudiation in the 1950s. Mao Zedong in 1951 wrote a *People's Daily* editorial criticizing *The Story of Wuxun*, which describes an educator who raised money by begging. In 1954, he supported two young critics of Yu Pingbo, a specialist of the classic Chinese novel *The Dream of the Red Mansion*, which finally initiated mass criticism of Hu Shi's theory. In 1955, the criticism of Hu Feng's ideas on art and literature escalated and members of the so-called Hu Feng counter-revolutionary clique were arrested. In February of 1957, Mao Zedong put forth the idea of letting 'a hundred flowers bloom, a hundred schools of thought contend', which was a correct policy to let art and science thrive. However, it was virtually given up after the anti-rightist struggle in the same year. After 1962, criticism expanded from art and literature to the fields of philosophy, economics, historical study and educational science. In 1966, the so-called Cultural Revolution was launched with the criticism of Wu Han's *Hai Rui Dismissed from Office*. The extreme idea of negating and sweeping everything away caught fire. Most of the schools suspended classes and the majority of cultural establishments were paralyzed; many important people were branded as 'demons and devils'.

Not long after the founding of the People's Republic, the government carried out a campaign to reform the educational system and education made headway on this basis. However, it was completely destroyed during the Cultural Revolution. After the overthrow of the 'Gang of Four', educational development returned to normal. The Chinese government decided in 1977 to restore the university entrance examination. A degree system was instituted in 1981. The Law on Compulsory Education was promulgated in 1986, calling for implementing the nine-year compulsory education program in a planned way. As the government was running the world's biggest education system, it found itself seriously short of funds. More recently, with a view to helping children who drop out of school in poverty-stricken areas, 'Project Hope' has been launched to rally society at large to support education.

Science has developed considerably in the People's Republic. The Chinese Academy of Sciences, with 22 institutes, was established in 1949. Since 1985, thanks to Deng Xiaoping's idea of 'science and technology as the primary productive force', the government has made a series of decisions to reform its scientific and technological management system. Now, China has set up a fairly comprehensive scientific and technological system and Chinese scientists have achieved major successes in theoretical mathematics, high-energy physics, structural chemistry, Earth science and biology. In the meantime, the oil, iron, steel, electronics, nuclear and space industries have grown rapidly.

China decided to build a nuclear industry in 1955. Such outstanding scientists as Qian Sanqiang, Zhao Zhongyao, Wang Ganchang and Deng Jiaxian contributed their talents to the cause. China successfully exploded its first atomic bomb on 16 October 1964 and its first hydrogen bomb on 17 June 1967. With great attention to the peaceful uses of nuclear energy, the Chinese government has of late built nuclear power plants in Zhejiang and Guangdong.

In 1963, China pioneered microsurgery and has since remained in the front ranks. The following year, Chinese scientists in their earliest efforts artificially synthesized bovine insulin and then yeast alanine transferred ribonucleotide. In 1983, China made a super computer capable of calculating well over 100 million times per second.

China launched its man-made Earth satellite on 24 April 1970 and its long-distance carrier rocket in May of 1980. And the new-type rocket Chang Zheng No. 3A, which can carry up to 2.5 tons was, launched in 1994. By August of 1994, China had launched a total of 42 multi-purpose man-made satellites. It has attained advanced levels in satellite return, multi-satellite rocket carriers and satellite surveying and control. In 1994, Chinese scientists could claim to be in the front ranks in nano-scale technology.

Science and technology have played a decisive role in China's economic growth. Before its founding in 1949, China only produced 120,000 tons of crude oil. Since 1959, based on new theories, a number of oilfields such as Daqing, Shengli and Dagang were discovered with an annual oil output of 146 million tons in 1994. From an oil-poor nation, China has become a major oil producer.

With full attention to natural scientific research, the Chinese government has established the national natural science funds and national natural science prize, the national prize for scientific and technological advancement as well as the national prize for scientific and technological inventions. The Chinese Academy of Engineering was established in June of 1994. The He Liang-He Li Fund prizes were conferred on Qian Xuesen, Huang Jiqing, Wang Ganchang and Wang Daheng in Beijing in January 1995. Qian Xuesen has done pioneering work in aerodynamics, aviation engineering, jet propulsion, the theory of engineering control and physico-mechanics, and played a tremendous role in the development of China's space industry. Huang Jiqing is a pioneer in geology in the People's Republic. His tectonic theory has guided China to major breakthroughs and discoveries of oil reserves in the land-facies sedimentation. Wang Ganchang is a pioneer and founder of Chinese nuclear physics. Wang Daheng has made outstanding contributions to the establishment and development of optics, optical engineering, optical precision machinery, space optics, laser science and metrological science. Among the 20 scientists who won the Fund prizes, Wang Yuan is one of China's leading mathematicians in the theory of numbers; Chen Jingrun is well-known for his proof of the Goldbach conjecture; Wang Zhenyi is a leading medical scientist in the treatment of leukaemia and a winner of the Catherine Prize – one of the major international awards in cancer research; Wu Mengchao is one of China's founding fathers of liver surgery; and Yuan Longping is the 'father of crossbred paddy rice' as he is called in the international scientific community.

The open reform policy in the current stage of development has provided both the social sciences and humanities with very good development opportunities. The Chinese Academy of Social Sciences was established in 1977 on the basis of the previous Department of Philosophy and Social Sciences of the Chinese Academy of Sciences. In 1978, the Chinese government decided to compile *The Chinese Encyclopedia*. The publication of all 74 volumes of

the *Encyclopedia* with 80,000 entries in 69 disciplines of knowledge totalling 125 million Chinese characters was completed in 1993. It is the biggest publication in the last few years. Other important publications include *The Complete Works of Chinese Art*; *The Atlas of Chinese Historical Maps*; *The Complete Works of Studies on the Characters Inscribed on Tortoise Shells*; *The Modern China Series*, etc.

Outstanding work has been done in archaeological excavations and protection of cultural relics. Excavations have been made in Hemudu (7000–5000 BC), the burial place of the terracotta warrior and horse figurines in the Mausoleum of Qin Shi Huang, the tombs of the Han Dynasty in Mancheng (second century BC) and Mawangdui, the Tomb of the King of Nanyue (second century BC). The fossils of the Lantian and Yuanmou apemen, gold-and-jade-inlaid garments, sets of ancient musical bells, paintings and calligraphic works made on silk, and bamboo slips inscribed with characters have been unearthed. Since 1961, the Chinese government has declared 242 places of historical or cultural interest under state protection. Beijing, Xi'an and some other cities are listed as famous cities of historical and cultural interest. The Forbidden City, the Great Wall, Zhoukoudian, the Mausoleum of Qin Shi Huang and the Dunhuang Grottoes have been inscribed on the UNESCO World Heritage List.

Such writers as Guo Moruo, Lao She, Tian Han, Ba Jin, Zhao Shuli and Yao Xueyin, who had already made a name for themselves, maintained their creativity after 1949. The play *Teahouse*, written by Lao She, reflected the social changes during the period of the Republic of China. Such novels as *Red Banner* and *Red Crag* try to give an in-depth study of large-scale artistic and historic works. He Jingzhi, Guo Xiaochuan and Wen Jie made their own experiments in the composition of new poetry.

During the Cultural Revolution, all withered except for modern Beijing Opera plays such as *Sha Jia Bang*, *Red Lantern* and *Seizure of Wei Hu Mountain* and the ballet *Red Women's Detachment* and four other so-called model plays. After the Cultural Revolution the 'scar literature' that describes the storm and stress of that tragic period became fashionable. Ever since all kinds of schools of creative art with different styles have thrived in a pluralistic structure.

The People's Republic has trained a large group of talented musicians. Fu Cong and many other pianists and vocalists have won international prizes. The violin concerto about Liang Shanbo and Zhu Yingtai describes a tragic love story with moving rhythms. The instrumental ensemble 'The Moon in Spring Water', adapted from the work of the same title by Hua Yanjun, a folk artist, moves the audience in the same way as if they were listening to a tragic story. *Rain of Flowers on the Silk Road* and *Fish Beauty* are, respectively, representative works of China's national dance and ballet. Chinese traditional acrobatics, after revision and improvement, have won many international laurels.

Though in use for thousands of years, Chinese characters are highly complex. The Chinese Character Reform Committee was established in 1954. It promulgated the general list of Chinese characters with simplified strokes in 1964. In the meantime, the Chinese government decided to popularize Mandarin Chinese, based on the Beijing dialect, in 1958. It announced the draft plan for the pinyin (Latinized on the basis of the pronunciation of the Chinese words) of the Chinese language in 1958 as a complementary

means to studying Chinese. At present, Mandarin Chinese has become the principal language of communication across the country. Thanks to the birth of a series of computer input modes such as the five-stroke system initiated in 1983, Chinese has been successfully applied in computer processing.

China is a country with more than fifty nationalities. The Chinese government practices national autonomy and freedom in religious belief. Chinese writers collected and collated in a planned way folk works handed down orally among the minority ethnic groups. The Mongolian epic *Jiange'er*, which speaks of brotherhood, marriage and war, has 100,000 lines of verse and is the literary treasure the Mongolian people. The Tibetan epic *The Story of the King of Gesa'er* portrays the heroic image of King Gesa'er and expresses the wish of the Tibetan people for political stability, prosperity and improved working conditions. The Chinese government has also devised written languages for such nationalities as Yi, Dong, Lahu, Jingpo, Zhuang, Bouyei (Puyi), Li, Xibo and Wa, which used to have only oral languages.

The level of sports practiced during the period of the Republic of China was very low. But after 1949, thanks to hard effort, it has risen. China has stayed at the top of table tennis honours for a long time. The Chinese women's volleyball team won the championships five consecutive times in major world championships in the 1980s. The Chinese men's gymnasts team won the world group championships several times. China re-joined the Olympic family and its sharpshooter Xu Haifeng scored its first-ever Olympic gold medal at the 1984 Los Angeles Olympic Games. In the last few years, the Chinese have scored a flurry of honours in weightlifting, diving, women's basketball, women's swimming and women's intermediate and long-distance running. In 1993, the Chinese won 103 world championships, and 38 athletes and 7 teams broke the world records in 57 events on 124 occasions. In 1994, they won 79 world championships and broke 41 world records. At the Hiroshima Asian Games of the same year, as China's gold medal tally was far more than the Republic of Korea and Japan, China became Asia's No. 1 sports power. However, China's track and field and men's football still lag behind but are catching up fast.

China is the country with the largest population in the world. In 1953, the Chinese government endorsed 'Rules for Contraception and Artificial Abortion'. It made an explicit call for birth control. Ma Yinchu, the President of Beijing University during that time, published his *New Theory on Population* in July of 1957, proposing control on the population and improving its quality. Unfortunately, his ideas were mistakenly criticized. Since the 1970s, the Chinese government has worked hard to control the population increase, and the birth rate dropped from 33.43 per thousand in 1970 to 18.09 per thousand in 1993. In the past 20 years or so, China has had 300 million fewer babies born. However, as the base number of population was too big, Chinese population hit the 1.2 billion mark in February of 1995.

Traditional Chinese medicine is one of China's major contributions to humankind. The Chinese government promotes the integration of Western medicine with traditional Chinese medicine and the collation of traditional Chinese medical heritage with scientific methods. The ancient art of medical treatment – acupuncture and deep

breathing exercises – has been rejuvenated, and acupunctural anaesthesia has been applied. In the last few years, Chinese medical scientists have been trying to use traditional Chinese medicine to treat such deadly diseases as cancer and AIDS. Many of these traditional ingredients have now been validated.

The tremendous development of science and culture after 1949 is clearly reflected in the following figures. By the end of 1994, there were 20,516 scientific research institutes, 1.53 million scientists and engineers, 1.88 million physicians and surgeons; 128,000 postgraduates, 2.8 million university students, 58.26 million middle school and polytechnic school students, 130 million primary school pupils. China boasted 2,681 performing art troupes, 2,875 cultural centres, 2,579 public libraries, 1,140 museums, 3,585 archives, 1,108 radio stations, 764 TV stations. Radio broadcast and TV transmission covered more than 80 per cent of the population. China produced 148 movies, printed 18.67 billion newspapers and 2.25 billion journals and published 5.93 billion volumes of books in the same year (excluding Taiwan, Hong Kong and Macao). Nevertheless, China is a big nation that had been poverty-stricken for a long time. It is still a developing nation with difficulties and problems of all kinds. China ranked 65th among 130 nations for life expectancy in the UNDP's Human Development Index in 1994. At the same time China had 180 million illiterates over 15 years of age and the national average time in school was only 5.4 years. By 2002, the UNDP's *Human Development Report* showed the following improvements: Life expectancy at birth had risen to 70.9 years; adult literacy ages 15 and above had risen to 90.9 per cent, and combined gross enrolment for primary, secondary and tertiary schools had risen to 68 per cent.

## Taiwan

Defeated in the Civil War, Chiang Kai-shek fled to Taiwan in 1949. After an initial period of chaos, Taiwan's economy began to take off from 1964 to 1973 and science and culture correspondingly made headway.

The Taiwan authorities designated 1954 as the year of science. They established a Science and Education Committee in July of that year that worked out the 'Long-Term Program for the Development of Science' and set up the Long-Term Science Development Committee in 1959. The Taiwan Academia Sinica got financial support from the United States and established centres of mathematics, physics, chemistry, biology and engineering science in 1964. The Science Promotion Committee headed by Wu Dayou was established in 1967. The Taiwan authorities expanded the Science Development Committee and set up the National Science Committee of the Executive Yuan in 1969. Ever since, the funds for scientific and technical research and the number of people engaged in scientific research have rapidly increased. The funds appropriated to scientific and technical research rose nearly five-fold and the number of people engaged in scientific research shot up by 100 per cent in 1981 as compared with 1978. Nevertheless, scientific research in Taiwan is mostly in applied science, and basic research receives much less attention.

Not long after he went to Taiwan, Chiang Kai-shek promoted the slogan of 'education first, teachers first'. Since

1968, the Taiwan authorities have mandated nine years of compulsory education. They promulgated the National Education Law in 1979 and Rules for Compulsory Education in 1982, stipulating that nationals from 6 to 15 years of age must go to school and that those who fail to do so will be fined. In 1982, the rate of attendance of junior high school pupils reached 98 per cent. To develop vocational and technical education, Taiwan set up the Industrial and Technical College in 1974, enrolling graduates from senior vocational schools. Their aim is to link up the vocational schools, polytechnic schools and technical colleges with education and employment.

Taiwan's film industry has made rapid progress. Its output of feature films recently ranked third in the world, coming after Japan and India. However, though the output was high, the quality was variable. There is a new wave of ideas almost every eight or ten years in Taiwan's literature as the pendulum swings between traditional native literature and modernism. A good representative of the former is Chen Yingzhen, and Bai Xianyong is an important modernist writer.

## JAPAN

This section is divided into two periods: the interwar period and postwar development.

The Chinese were earlier than the Japanese in recognizing the superiority of Western astronomy in the seventeenth century and the strength of foreign military technology in the mid-nineteenth century. But the Japanese excelled in recognizing the importance of the industrial infrastructure behind modern military technology and the significance of Western political institutions such as imperialism. In the process of catching-up in military technology at the turn of the century, Japan overstepped the mark and launched into imperial expansion by invading neighbouring Asian countries.

### The interwar years

The First World War did not yield any significant breakthroughs for Japanese science and culture. The war was largely a European matter, but Japan nevertheless took advantage of it. Because of the lack of Western competitors in Asian markets during the war, Japan enjoyed a veritable economic boom.

Ideologically, however, like everywhere else in the world, Japanese intellectuals and scientists were fascinated by the success of the Soviet Revolution in 1917. The periods that followed the First and Second World Wars are similar in being characterized by waves of democratization, although the political contexts of these periods are quite different. The former is called Taisho democracy (after the name of the era), whereas the latter is dubbed 'sengo' (post-war) democracy. As the name suggests, 'the war' for the Japanese means the Second World War, not the First.

The post-First World War economic boom mentioned above was accompanied by the expansion of higher education. Up until that time, the government bestowed university status only on governmental institutions where faculty and students were, according to the constitution, supposed to serve the national interest. Parallel to the rise

of the Taisho democracy and the privatization trend were government measures in 1914 aimed at reforming the university system. These were put into effect in 1918, when an act was issued to confer university status on private as well as prefectural institutions, and what is more, research was added to the official function of universities in addition to education. As a result, a number of higher education institutions were established after the First World War. However, when the students who had been admitted into the expanded higher education system graduated, they were greeted by economic depression in 1928 and the following years. Unemployment was high.

It was, however, thanks to lessons learnt from the First World War that scientific research, particularly in the field of chemistry, was for the first time recognized as an indispensable component of a modern nation-state. Because supplies had been disrupted by the outbreak of war in Europe, Japanese industries made serious attempts at developing import-substitution technology. Reverse engineering was the major path they followed. All of the above encouraged the establishment of both public and private research institutes.

Scientists had previously been busy establishing university education, part of the institution-building in the early phase of modernization during the Meiji period. The post-First World War generations were freed from such tasks and sought, instead, to challenge the research frontier being forged in Europe. The Japanese scientific community had come of age and was able to produce internationally oriented academic scientists.

Internationalism prevailed in the scientific community, with luminaries such as Albert Einstein, Margaret Sanger, and H. G. Wells invited to visit Japan and enthusiastically welcomed by Japanese intellectuals and scientists.

Public universities were the most important, if not the only, windows on the West, through which new trends in science and culture entered Japan. Universities enjoyed high status compared to public and private laboratories and institutions.

University-affiliated research institutes came into existence right after the First World War. The first such institute was the Aeronautical Research Institute, affiliated with Tokyo Imperial University, which was inaugurated in 1918. This was followed by the Tokyo Astronomical Observatory, also of Tokyo Imperial University (1921), the Metals Research Institute of Tohoku Imperial University (1922) and others. In these institutes, professors and assistant professors were all appointed to engage solely in research work, while enjoying life-long tenure.

After half a century spent transferring Western culture, science and technology, first from the West to the Japanese public sector and then from public to the private sector, the private sector had been placed on a strong footing.

Let us take a typical example of Japanese private science development in the Toyoda family. Sakichi Toyoda, the founder of the Toyota Corporation, was a local carpenter who took advantage of the domestic patent system and imitated imported machinery. He established the Toyoda Loom Works in 1906. It was his son Kiichiro, a graduate of the Engineering College of Tokyo Imperial University, who started a systematic approach to research and promoted the family's entry into the automotive industry in the late 1930s.

In the absence of a rich domestic market, the Japanese car industry initially had to depend on military subsidies.

Rather than aim at the production of passenger cars, the goal was to build up domestic capability in the production of trucks and tanks, both essential to national security. The development of Japanese aircraft technology was equally dependent upon military support throughout the interwar period. Thus, privatization went half-way, largely dependent on military sponsorship and government encouragement.

There emerged, however, another line of scientific and technological development in the post-First World War period. Following developments elsewhere during the war, a growing number of businessmen, academics and bureaucrats became convinced that Japan needed a large, centralized, research establishment. They tried to copy the recently established German Kaiser Wilhelm Gesellschaft (established in 1911) and founded Rikagaku Kenkyusho (the Institute of Physical and Chemical Research, abbreviated as Riken) in 1917. In 1937, they promoted *kagakushugi kogyo* (scientific industry) rather than 'capitalistic industry', reflecting the technocratic stance that they subscribed to.

The idea of a science uncontaminated by capitalism was not translated directly into any actual movement of scientists, as the system was so radically different from elsewhere. Only after the big 1923 Tokyo Earthquake did a student-led movement aimed at relief for the poor emerge among medical students at Tokyo Imperial University. The students were suspected by police of being political dissidents.

Senji Yamamoto, a pioneering leftist biologist, had been active in claiming laboratory democracy and advocated 'proletariat science'. He participated in the labour movement and popularized Margaret Sanger's ideas of birth control. He was assassinated by a right-wing extremist in 1929.

From 1930, government suppression of left-wing thought became so severe that many scientists turned to the history of science, and philosophical discussions on science and technology. The historical materialism advocated by Boris Hessen at the Second International Conference of the History of Science in 1931 was enthusiastically studied and two translated versions of his work appeared in Japan.

Kinnosuke Ogura and other scientists and philosophers formed the Yuibutsuron Kenkyukai (Society for the Study of Materialism) in 1932 and issued their monthly *Yuibutsuron Kenkyu*. Most of its members were arrested and imprisoned. In 1941, the year that Pearl Harbor was bombed, the History of Science Society of Japan was organized, providing shelter for many leftist and liberal scientists who joined it. By replacing the words 'Marxism' or 'materialism' with the word 'science', they were easily able to avoid official censorship.

In 1931, the government tried to cope with the economic environment by shortening university education and by professionalizing the higher education sector. Such measures were doomed to fail, given the fierce opposition of the university establishment. In that same year, the Manchurian Incident occurred. In the subsequent economic boom created by military production, the need for rationalization of the tertiary education sector was no longer necessary. Thus, Japan's recovery from the Depression came earlier than in the USA under the New Deal.

It was against the backdrop of a military oriented economic boom that the Japan Society for Promotion of Science (JSPS) was established towards the end of 1932.

The JSPS encouraged group rather than individual research, and also invited not only university scientists but also private, government and military scientists to cooperate in team projects.

During the war, Japan was isolated from the Western world, its major source of scientific and cultural information. Only a very limited number of scientific journals were imported by submarine from Nazi Germany.

Ironically, however, it was a happy period for Japanese scientists and engineers who, for the first time, were recognized as being indispensable to the war effort. It was also a time during which Japanese scientists became more independent of Western influence.

Japanese efforts were spearheaded by the establishment of a new Technology Agency aimed at enhancing state control of science and technology. Unfortunately for the Agency, other governmental departments did not cooperate and their attempts to harness science for the war effort were lacklustre. Science students were exempt from conscription during the war. The ratio of humanities majors at higher schools to science majors was normally 6:4, however, this ratio was effectively reversed by government policy, which sought to increase the number of scientists and technologists. By the end of the war in 1945, humanities majors had practically disappeared, having been conscripted prior to graduation.

During the first 30 years of this century a new culture based on popular society took shape. This was exemplified by the popularity of the modern novel as the favorite literary form. Toson Shimazaki wrote *The Broken Commandment*, which described the self-awakening of lower-class youth in Japan. Katai Tayama's novel entitled *A Cotton Quilt* vividly depicted a middle-aged intellectual's longing for a schoolgirl. Their works reflected the thoughts of Japan's new social classes in early years of the century.

There was a sharp struggle between the different approaches to culture. One ideological stream was Minbonshugi (Japanese Democracy), and Tatsukichi Minobe, a Professor at Tokyo Imperial University, was its major standard-bearer. This trend propelled the popular movement for democracy and freedom. Another trend sided with modern international views, which advocated cutting down on armaments and initiating peace, for the sake of international cooperation with Europe and America.

## The postwar period

Postwar reform in Japan was wide in scope. Land Reform, the most important, affected the very powerful class of peasant landowners (89.1 per cent of peasants). Secondly, workers' power was rising. By 1960 ten million workers participated in various kinds of trade unions and workers' movements on a daily basis. Under pressure of the left wing and community of nations, Japan promulgated a new Constitution in 1946, clearly stipulating that sovereignty is formally vested in the people. Article 9 of the Constitution says that Japan should relinquish all armed forces and abstain from war. On the other hand, the system included the existence of political parties and an executive Cabinet. In 1955, a number of conservatives joined the Liberal Democratic Party. For the next 38 years the LDP (Liberal Democratic Party), having most seats in the House of Representatives, was continually in office. The Socialist and Communist Parties and other left-wing parties were powerful in the opposition because they united the workers and masses in Japan's cities. A desire for peace was the prevailing trend, and Marxism, existentialism and American philosophy were all warmly welcomed by the Japanese.

The post-First World War phenomena of Taisho democracy was revived after the Second World War and labelled 'sengo' democracy. Despite apparent similarities, the two democratic movements were radically different. The former was primarily an intellectual exercise imported from the West, whereas the latter was adopted according to the American occupation policy. Even though imposed by the occupation directives, democracy was welcomed wholeheartedly by the Japanese, who had bitter memories of the coercive, ultra-nationalistic ideologies of the wartime and military governments.

In January 1946, Japanese intellectuals and scientists created the Federation of Democratic Scientists (Minka) in the hope of rebuilding a democratic Japan through the creation and dissemination of science. Though organized by prewar Marxists, membership in the new organization was extended to all who were active in every field of learning, including academic scientists, practicing engineers and medical doctors. Their common enemy was wartime militarism, which was viewed as having impeded the development of science and democracy. Their slogan resembled that of the Chinese May Fourth Movement in 1919, where science and democracy were promoted as part of a political campaign to combat feudalistic Confucian traditions.

The occupation forces sought to eradicate the militaristic elements of Japanese society and encourage research and development primarily for economic recovery. They were less enthusiastic about promoting basic science, which they considered as being too extravagant in a country fighting off mass-starvation.

After the occupation, the Japanese switched from a wartime survival strategy based on military technology to a more market-oriented, commercial one. Nevertheless, the same 'progress or perish' drive has characterized Japanese industry even to this day.

Those in Asia who had survived wartime Japanese invasion watched fearfully lest there be a revival of Japanese expansionism. But Japanese people had also been victims of harsh wartime suppression of thought and expression. Those who had suffered during the war became steadfastly pacifist, and it was they, in the final analysis, who were responsible for transforming military-oriented science and industry into economy-oriented progress.

After the end of the war, Japanese academic science was still respected internationally, as it was possible to carry out research equipped only with 'pencil and paper'. This was exemplified by the theoretical work of Hideki Yukawa, who was the first Japanese scientist to be awarded the Nobel Prize in 1949. Meanwhile, corporate science was undergoing a crisis due to economic stagnation, but this situation was reversed as economic recovery advanced. Today, the private sector contributes more than 80 per cent of total Japanese R&D expenditure.

Although the centre of scientific activity shifted from Germany to the USA in the 1920s and 1930s, the Japanese scientific community adhered to the old pattern of sending students to Germany as in prewar days. During the

occupation years, however, the trend changed radically and almost all went to the USA, taking advantage of Fulbright programmes and others scholarships to pay their way. Upon their return, they established new paradigms and became the leaders in their respective disciplines.

In the 1970s, the situation was reversed after the high economic growth of the 1960s. Americans no longer had the funds to hire Japanese academics, constrained by severe budget cuts implemented around 1968. On the other hand, the Japanese industrial sector began sending their employees to American laboratories where professors had research contracts with Japanese corporations. In the meantime, Korean and Taiwanese scientists in the USA were being lured back home by their home governments' policies aimed at reversing the brain drain.

In the 1970s, there were scientist-critics who quit their trade and became 'ecologists' of a kind, berating science for its detrimental impact on society. A literary critic, Junzo Karaki wrote a famous 'Memorandum on the Social Responsibility of Scientists' which questioned the way of thinking of Hideki Yukawa, Japan's Nobel laureate in physics, who had been active in urging the abolition of nuclear bombs. He suggested that he should direct his attention more to matters concerning his professional occupation rather that focusing on the more basic value of human existence.

It was a time when Western historians of science started to look upon traditional East Asian science as an 'alternative science'. In the late 1960s, China proclaimed a new research method in science involving mass participation of the type espoused by 'barefoot doctors'. This movement was interpreted by Japanese radical intellectuals as being an experiment in anti-professionalism, and viewed as providing timely lessons for the overspecialized science profession found in advanced countries. For developing countries, it suggested a more realistically attainable goal of appropriate technology.

Progressivism was seriously challenged by the campus protests of the late 1960s, which hit most industrialized countries in the West. Japan was no exception, even though political causes like the Viet Nam War were missing and economic growth was at its height.

The student protests and university reforms of 1968–70 and the environment and ecology movements in 1972–73 had an impact on science and culture; however book publication statistics show that the oil crisis, which occurred in the fall of 1973, had a greater influence on ordinary citizens, encouraging a change in attitude towards the use of natural resources and energy. It was not student campus riots so much as the anti-pollution movement that had the greatest impact on industry. This, combined with the oil shock of 1973, encouraged the government, particularly MITI (Ministry of International Trade and Industry), to shift the focus of industrial policy from 'heavy, thick, long and large' kinds of products manufactured by energy-intensive heavy and chemical industries to 'light, thin, short and small' products manufactured by knowledge-intensive industries such as microelectronics and biotechnology. In spite of the transformation of Japan's industrial structure and the trauma of two oil shocks, Japanese industry as a whole continued to develop into the 1980s.

In the 1980s, it was widely noted that a special feature of Japanese culture has been its high technology. The Science and Technology Agency promoted the slogan *kagakugijutsu*

*rikkoku* ('nation building by science and technology', a type of technonationalism). The words have the nationalistic connotation of building up Japan's own creative technology as a bargaining tool against the USA. Neither European nor Third World countries featured in the Japanese range of vision.

Since 1980, the US has recognized Japan as a technological competitor and the FBI started investigating Japanese infringements of American intellectual property rights. The IBM industrial espionage incident in 1982 involving the arrest of Japanese company personnel by the FBI shocked the world. The Japanese, mindful of a hostile US attitude, adopted the new slogan of 'internationalization' instead of 'technonationalism'. This change of slogan implied a general switch in international strategy from competition to cooperation.

The change in slogan was officially recognized by the Science and Technology Council in 1984. Corporations differed in how they incorporated internationalization into company policy, but most microelectronics companies like NEC, Toshiba and Mitsubishi adopted appropriate measures in the mid-1980s in order to avoid headlong conflict with the USA. Internationalization also served as a way of familiarizing employees with foreigners who were given positions alongside them at the workplace.

Some companies acquired costly research institutes in the USA, in an attempt to promote synergies with American enterprises. The result has been that R&D is less and less subject to the control of the Japanese government.

After the Second World War, along with Japan's economic recovery and rapid growth, the country has stepped onto the stage of international culture since the 1960s.

In late 1940s and 1950s, many Japanese people became introspective and self-critical about their responsibility for the war: they advocated 'a hundred million people repentance'. A whole school of literature emerged whose main subject was to dissect the reasons and the horrors of the war. With the second and third generations the trend was towards pacifism. Yasushi Inoue wrote a number of works, such as *The Top of Building in Tenbyo Period* and *Dunhuang*, praising friendship between the peoples of Japan and China.

After the 1950s and with the economy reviving, Japan adopted a more popular society. The way of life also changed under the influence the American culture. All kinds of popular media flourished. Newspapers like *Asahi Shinbun*, *Mainichi Shinbun* and *Yomiuri Shinbun* were so popular that their combined circulations reached sixty million copies. Broadcasting, TV and magazines became an important part of people's daily life. Popular writers such as Seicho Matsumoto, Seiichi Morimuro, Jiro Akagawa and Shinichi Hoshi sold millions of their books. They described common Japanese joy, anger, grief and happiness; or they recounted dark transactions between political and financial circles. Adult fairy tales, mysteries and science fiction were equally important trends in popular culture.

Japanese culture also went out to the world. Traditional Judo was successfully placed on the international Olympic Games' events. Kara-Okay, better known in the West as karaoke, a kind of self-entertainment, was invented and introduced everywhere in the world with the aid of electronically recorded music. Yasunari Kawabata and Kenzaburo Oe were awarded Nobel Prizes for literature, the former due to his depiction of Japanese traditional beauty, and the latter due to his humanism.

After the 1970s, there was a return to tradition in Japanese culture. Traditional opera again became very much appreciated. Some famous Kabuki actors and actresses were given the title of National Treasure on Earth. The major reason for this trend was Japan's role as an economic giant, rising nationalism and emphasis on Japanese cultural specificity.

## Conclusion

The most remarkable transformations during the period are summarized below. The notion of progress for survival was the major driving force for the Japanese, during both the prewar period of arms build-up, and in the postwar period of economic recovery. This zeal was also responsible, however, for overseas colonial expansion in the prewar days and contributed to the environmental pollution which Japanese society had to face in the postwar period. High technology was and has been the most prominent feature of postwar Japanese culture, occurring in the absence of any particularly serious religious, class or race conflicts, and at a time when ultra-nationalism had been largely wiped out. Economic development was mostly entrusted to the private sector, with some official guidance during the early days of technology transfer. In this way, lessons were learnt from Japan's prewar experience but at the high cost of defeat at the end of the Second World War.

## THE KOREAN PENINSULA

By the end of nineteenth century, with the adoption of an open port policy, science and technology were introduced from the Western world into the Korean Peninsula.

In 1898 a joint venture was established by the Korean royal family between Seoul Electric Company (Hansong) and an American named Colbran. As a result, the first streetcar showed up in Seoul. In 1900, electric lights and modern lighting installations were also introduced in Seoul. In the early twentieth century, two railway lines, Seoul to Pusan and Seoul to Sinuiju lines, were constructed by the Japanese.

Around 1904 and 1905, Korea was forced to accept the so-called protection of Japan, which initiated the bourgeois national independence movement and the patriotic enlightenment movement. Though distinctive from each other, the two movements jointly formed the dominant political and cultural concern. Educational aspects of this new cultural movement were taken over by The New People's Association, along with other enlightened organizations. Before 1910, when Japan finally annexed the peninsula, 3,000 modern private schools had been established in Korea. Feudal culture and thought were disappearing, and modern science, history, geography, law and mathematics were successfully introduced. Such names as Auguste Comte, Hegel, Bacon and other modern philosophers' theories were widely known.

The New Cultural Movement aimed at arousing people's consciousness and attacking the Japanese invaders. Articles written by two forerunners of the movement, Chang Chi-yon and Huang Hyun, attacked Japanese annexation and ignited the wrath of the Korean people. Their articles were reprinted in various international newspapers.

After the annexation Japanese administrators issued a so-called education law, and schools were now under their strict control. Koreans were forced to adopt Japanese names. As a result, Korean students were being kept in ignorance of their own culture. Between 1910 and 1922, the number of private schools in Korea dropped from 2,000 to 600.

In 1919, the March First National Independence Movement along with the declaration of independence issued in Tokyo by 33 independence advocators encouraged the Korean people to resist Japan and liberate their own country. After this movement, Marxism and Leninism were introduced to Korea. Marxist study groups, like the Proletariat Federation, the Reading Club and the Social Science Research Society, appeared in Seoul, Pyongyang, Pusan, Daegu, Hamhung, Wonsan, Inchon and other industrial cities as well as some rural areas. Such magazines as *New Life*, *The Light of Korea* were published in public and propagated Marxism and Leninism. Various resistance groups, political parties and organizations were founded, whose aim was to expel the Japanese invaders and gain independence.

In the early twentieth century, Korean science and technology saw little progress, though *The Korean Science History* was published by Hong Yi-sup, and bridge construction and ship-building started to develop. In 1917 the schools for specialized scientific and technological training appeared. However, by the end of 1944, there were only 266 graduates, and by the end of the Second World War, only 700 graduates in total from the Kyongsong Industrial School, the Kyongsong Mining School and the Daedong Industrial School.

In 1931, the establishment of the Society of Korean Language Research initiated the reform of Korean characters. This led to the Society producing a *Korean Dictionary* and *Unified Principle of the Orthography of the Korean Alphabet*. These were not only academic achievements, but also meant the enlightenment of the academic circle. In 1933 the new spelling system issued by the Society had spread throughout the country.

The seeds of the new literature planted in the early twentieth century began to bloom about 20 years later. The New Trend School (also called Puro) started in 1923, and was soon well established. The Korean Proletariat Artists Federation (KAPF), set up in 1925, promoted Puro literature. Meanwhile, the anti-Japanese literature was also flourishing. Such poets as Han Yong-un, Yi Yuk-sa and the writers Yi Sang-hwa, Sim Hun, and Hyon Chin-gon were representative figures of the period. Other masterpieces include *Your Reticence*, written by Han Yong-un, *Some Day*, by Sim Hun, and *Poor Wife* by Hyon Chin-gon.

### The Democratic People's Republic of Korea

After the Second World War, the Korean Peninsula was split into North and South and in 1948 separate governments were established for each. The war between the two parts, which lasted from 1950 to 1953, was devastating for the entire peninsula.

For half a century, the two parts have offered contrasting political systems. The North respects a strict socialist system, while the South has adopted parliamentarianism.

The Juche Idea, the theoretical basis guiding the establishment of the Democratic People's Republic of

Korea (DPRK), and the Korean Labor Party focus on such principles as initiative in one's own political views, an independent economy and self-reliance.

The DPRK pays great attention to education. Soon after the country's founding, illiteracy was eliminated among the 2.3 million illiterate people who accounted for 25 per cent of the total population at that time. Starting from September 1972 an 11-year compulsory education system was initiated and in September 1977 an outline for socialist education was formulated. Today in the DPRK, children must be enrolled from nursery to high school. At the turn of the twenty-first century, the DPRK has the Kim Il-sung Comprehensive University and 170 other institutions of higher learning, as well as over 500 secondary specialized schools.

In December 1952, the Korean Academy of Sciences was established. In February 1964, the Academy of Social Sciences was separated from the former Academy of Science, and then the Academy of Medicine, the Academy of Light Industry, the Academy of Education, and the Academy of Agriculture were established in turn. In the 1970s an institute was established within the Social Academy of Science to focus on Juche Idea research. Today there are more than one million scientific and technological experts in the DPRK. In half a century, the DPRK has made good progress in science and technology. Achievements include producing fertilizer with clean coal, producing vanillin with limestone and producing fibres with reed. In the 1980s, the metallurgical and casting industries advanced, and synthetic rubber and chemical fibres can also be manufactured domestically. The development of nuclear capacity in recent years also suggests a certain level of scientific competence.

Since the 1970s, both the arts and sports have developed considerably. The general Federation of Literature and Arts, made up of special arts unions for writers, musicians, artists and film artists have created literary and artistic works and given performances in accordance with Juche art idea. The opera *Blood Sea*, the novels *The Year 1932* and *Pyongyang Time*, the historic novel *Peasant War between 1894 and 1895*, and the film *Fourteen Winters and Springs* were all warmly received.

In sports, Koreans have broken world and Olympic records in shooting. Its female athletes won gold medals in the 33rd and 34th World Table Tennis Championships. A youth get-together was held in Pyongyang in early July 1989. Students from 180 countries and regions, representatives from over 60 international organizations and 470 senior officials from over 90 countries participated.

**The Republic of Korea**

The Republic of Korea (ROK), established on 15 August 1948, has distinguished itself in education, science and technology as well as culture during its first half century. After the mid 1980s, its economy took off and, together with other dynamic, export-led developing countries in the Asian region, it became known as a 'tiger' economy.

The ROK adopted a distinctive approach to education that guarantees compulsory education at the primary school level. Beyond the primary level, however, it offers two types of further education: formal education, which takes the form of junior school, senior school, elementary professional

college, college, university and postgraduate education; and informal education, which includes citizen school, radio and correspondence school, and vocational training. Expenditure on education represents 22.8 per cent of the total budget of the government, and 3.2 per cent to 3.4 per cent of the annual GNP. As a result, educational institutions have developed rapidly. According to the statistics of 1991, there were 8,400 nursery schools and the numbers of primary, junior and institutions of higher learning were, respectively, 6,000, 2,500 and 580. Primary schools students totalled 4.75 million and all children of school age were enrolled in primary school. Some 99.5 per cent of these primary school graduates entered junior schools, totalling 2.23 million. There were 1.54 million students attending institutions of higher learning.

In 1954, one year after the end of the Korean War, the Institute of Sciences was established under the Ministry of Defense, the first institute of its kind in the ROK. In 1958, the Atomic Energy Act was passed by the parliament and a year later, the Atomic Energy Institute was established.

Since 1962, the ROK has been formulating five-year plans to develop its economy and promote its science and technology. On 1 April 1967, at the beginning of the second five-year plan, the Ministry of Science and Technology was established, a state councillor was appointed as supervisor and the country celebrated its first Day of Science and Technology, which marked the beginning of a new push to develop its national capacity in science and technology. The Korea Science and Technology Research Institute and the Korea Academy of Sciences were established respectively in 1968 and 1971. The financial group for funding sciences was also established to guarantee academics enough money to cover their research. As a result, the country installed a comprehensive system for science and technology research. In 1973, the ROK launched a national scientific movement to gain international prestige with technology and set itself the target of becoming one of the 10 leading world superpowers in terms of science and technology.

In 1978, a nuclear reactor for generating electricity for commercial purposes was built. By the end of the 1980s, 12 nuclear power stations had been built and by the end of 1991, the installed capacity of nuclear power plants reached 17.616 million kw, 47 per cent of the total electricity generated in the country. The ship-building industries saw rapid development, too. From the 1970s to the 1990s, the automobile output rose from 30,000 to 1.96 million cars a year, thus making the ROK a major car producer in the world, even though the area of the country is less than 100,000 square kilometres. In the 1960s, electronic technology in the country was limited to the simple assembly of semi-conductors and radios; now it means such hi-tech products as complete information transmission systems, large screen digital colour TVs and laser disks. At present, the ROK is the world's second biggest manufacturer of video recorders, microwave ovens, and facsimile printers. It takes third place in manufacturing color TVs and telephones.

To realize the strategic target of becoming a superpower in science and technology, the ROK government and scientists spent 20 years constructing Taedok Science Town, an R&D science park that was completed in the early 1990s. Numerous research institutes and industries are located here with more than 70,000 specialists who work at the Korea Standard Science Institute, the Nuclear Power

Institute, the Electronic Communication Institute and Chungnam University. At present, another similar hi-tech town is under construction in Kwangju. The local governments of Pusan, Taegu, Jeonju and Kangnung also started similar constructions in 1993.

In the fall of 1993, EXPO '93 was held in Taejon, the third city in Asia after Osaka and Tsukuba in Japan to host such an event. Officially known as the Daejeon International Exposition, it was a kind of technological Olympics covering economics, science, technology and culture. At EXPO '93 Korean scientists demonstrated their achievements in such fields as resource utilization, information communication, space exploration, life sciences and environmental protection.

Post-war Korean society has witnessed a multi-faceted development. Under the 36 years of colonial rule and three years of war in the early 1950s, people suffered hardships and had no confidence in their future. Western existentialism took hold and influenced a young generation of artists and writers. *John's Collection of Poems* written by Chang Yong-hack, and *Square*, a best-selling novel by Choe In-hoon, were typical products. After the 1970s and the industrialization of the Republic of Korea, social conflict became increasingly evident as the two major ideological factions advocated either 'participation' or 'resistance'. 'Ozek', a poem written by Kim Ji-ha, a resistance poet, aroused people's concern with its attack on social injustice.

Despite the influence of American culture, many Chinese traditions persist. Koreans still practice Buddhism and Taoism, especially Confucian rites. The direct contact with Western philosophy intensified the interest in traditional culture and ideology.

The ROK has impressed the world with its flourishing sports scene, especially in ball games, water sports, wrestling, boxing and weiqi (also known as 'go'). In the 1982 New Delhi Asian Games, the ROK took third place, and in the 1986 Seoul Asian Games, it moved up to second place. At Los Angeles in 1984, it took 19 medals including six gold, six silver and seven bronze medals. The 1988 Seoul Olympic Games were a milestone in the ROK's sports history because South Korea was only the second country in Asia after Japan to host the Olympic Games, and it is the second capital of a developing country to welcome the Games, after Mexico City. The Olympic Center, Olympic Park, athletes' village and media centre were constructed especially to meet the needs of the Olympic Games. The ROK lived up to the name of sports superpower by taking fourth place in the world with 16 gold, 10 silver and 11 bronze medals.

## THE MONGOLIAN REPUBLIC

In the early twentieth century, the scientific and cultural levels of development in Mongolia were rather low. Influenced by the government's patronage of Lama Buddhism – the Yellow Sect – a great many men became monks. According to statistics, in the later Qing Dynasty, there were 747 temples and 105,577 monks in Outer Mongolia, constituting approximately 44 per cent of the male population. Before 1912, Outer Mongolia did not possess a single secular educational institution. Although modern civilization had already begun to spread in Outer Mongolia by 1915 – for example, with electric power plants,

workshops for the repair of firearms, and small-scale print shops, telephone companies, and telegraph bureaus – these modern facilities constituted a negligible share of the national economy.

In July 1921, the Mongolian People's Government, a constitutional monarchy, was founded in Ulan Bator with the aid of the Soviet Russian Red Army. In November 1924, the first convocation of the Great Hular, Mongolia's legislative assembly, ratified the constitution and pronounced the existence of the People's Republic of Mongolia.

Since 1921, the development of science, technology and culture in Mongolia has undergone three stages, corresponding to changes in its political and economic situation.

### 1921–1940 – development of democratic culture in a non-capitalist system

This initial stage of democratic cultural development in Mongolia began with a campaign to eradicate illiteracy. The campaign addressed not only lay people, but also lower-ranking monks as well. From 1935 to 1937, over twenty thousand junior monks participated in the study of Mongolian. By 1940, statistics suggest, 28.8 per cent of the population above 8 years of age was already literate – one of the principal achievements of the first stage of the Cultural Revolution. In 1921, Mongolia's first primary school was opened in the capital, Ulan Bator, and from 1922 schools for all social classes were set up one after another for each League and Banner (Mongolian socio-military administrative units), and in major residential areas. A financial management school was established in 1925, followed up by schools of veterinary medicine, telecommunications, and nursing in 1926, and the first normal school for training teachers in 1928. By 1940, the country possessed 319 primary schools, and the number of students was rising rapidly: the total of both primary and secondary school students surpassed 24,300, some 20 per cent of all school-age children at the time. Also in 1940, there were seven vocational schools educating 1,332 students, numbering 1.8 per cent of the population. In addition to education in these institutions, there were more than three thousand people receiving vocational training.

Mongolia's first scientific organization, the Institute of Economics, was founded in November 1921. It was devoted to research on language, literature, history, and folk customs. In December 1930, the Institute was enlarged to become the Committee on Science, to which agriculture and geology research departments were added. The Mongolian Institute of Economics and its successor, the Committee on Sciences, contributed greatly to research in Mongolian literature, history, geography, geology, botany, and animal husbandry. The various maps which they issued were of great assistance in the readjustment of Mongolia's administrative divisions, the exploitation of its natural resources and in planning its industrial distribution. The Institute's investigation of traditional pastoralism and breeds has raised the quality of Mongolian herds and increased herd productivity.

In the 1920s and 1930s, modern Mongolian literature progressed towards maturity. 'Yin He Ma,' 'Hu Qin Hu,' 'Country Scene,' 'First Moon Tears,' and the long poem 'My Motherland,' all by D. Nachukdolki, and the novel *The*

*Deserted Girl* and poem 'My White-Haired Mother,' by C. Damutinsulun – both founding fathers of modern Mongolian literature – are some of this period's most famous literary creations.

The curtain was raised for Mongolian stagecraft with the 1922 performance of the drama *Sando Minister*. Famous stage plays of the 1920s and 1930s include Nachukdolki's *Three Mountains*, *The Truth* by C. Buyanamohe, *Just Eighteen Years Old* by S. Ayouxi, and *The Wolf Pack* by D. Namudage.

During the same period, modern Mongolian visual arts and music also came into being. The painters Paledu Shalabu and D. Manebadar are especially well known; Manebadar excelled in his use of folk decorative patterns, and was deeply versed in traditional Mongolian fine arts. The most influential musician of this era was M. Dugarzhabu, one of the founders of modern Mongolian music, whose compositions 'The Red Flag,' 'Bounteous Mongolia,' and 'Little Cowherds' can still be heard today.

Mongolia's first cinema, the People's Movie House, opened in Ulan Bator in 1934. The nation's first motion picture studio was established in 1936, producing the film *Mongolian Man* as its first feature. In 1931, the Soviet Union helped Mongolia to construct its first radio station, which began broadcasting in May of that year.

The first modern hospital in Mongolia was established in October 1925 in Ulan Bator, staffed by Russian doctors. By 1940, Mongolia had a total of twenty hospitals, in addition to 177 branch hospitals and clinics as well as 923 native doctors and nurses.

Before the 1920s, Mongolia's principal athletic activities consisted of the traditional 'Thirteen Feats' (for men) – among them horse racing, wrestling and archery. But in the 1920s, modern sports began to spread in Mongolia, becoming popular mainly in the army, schools, and among the youth.

## 1941–1990: bypassing capitalism to formulate and develop a socialist culture

The Mongolian government succeeded to a high degree in combating illiteracy. According to statistics from 1971, 67 per cent of the population between the ages of 13 and 49 attained at least the primary school level of education. By 1975, that proportion had risen to 74 per cent. In the process of fighting illiteracy, the Mongolian government had decided to reform the writing system, replacing old Mongolian with a new Mongolian written language, accelerating to a certain degree the pace of the anti-illiteracy campaign. The development of ordinary and vocational education was likewise rapid. In 1960, Mongolia achieved its goal of educating all school-age children through primary school. In 1962, there were 419 ordinary schools, up to 570 by 1978. In addition, special schools were opened for orphans and for the physically and mentally handicapped. In 1965, the country possessed ten vocational schools, training two thousand students; by 1980, these figures had risen to 37 and 22,100, respectively. Between 1960 and 1980, the number of secondary school students more than tripled, from only 6,900 to 23,200.

The Soviet Union and other countries also contributed to the development of Mongolia's human resources, training more than 2,200 experts in their universities and polytechnic institutes. More than 90 per cent of the higher academic degrees held by Mongolian scientific research personnel between 1940 and 1960 were received from the Soviet Union. The Mongolian National University (MNU) was founded in October 1942. From 1942 to 1991, more than 27,300 students graduated from the University, and among them seventy-one doctors of science, 671 doctoral associates, twenty-six professors, sixty-five associate professors, thirty members of the Academy of Sciences, three national labour heroes, and twenty-nine recipients of national honours. At present, MNU contains four teaching and scientific research institutes, two affiliated colleges and research centres, more than a dozen laboratories, four departments, forty teaching and research sub-sections, nearly four hundred teaching and scientific research personnel, and trains 2,390 undergraduates and more than sixty postgraduate students.

With the expansion of scientific endeavours in Mongolia, the country's scientific institutions underwent several readjustments. In May 1961, the Mongolian Committee on Sciences and the Committee on Higher Education were reorganized into the Mongolian Academy of Science. However, the basis of science and technology in Mongolia was still weak, and progress was slow. The major scientific achievements of this period include the following.

Research in animal husbandry and veterinary medicine produced high-quality academic papers such as 'Surgical Therapy for the Treatment of Yak Dizziness,' and 'Sheep of the Gobi and Altai'. Contemporary husbandry and veterinary medicine began to make inroads; and new livestock breeds like the half-fine-hair 'Erhun' sheep and the Gobi Gurvan Saikhan goat were being raised. In agriculture, new 'Erhun' wheat was introduced, and new varieties of fruit trees were experimentally tested. Rapid growth occurred in geological and geographical research and mineral prospecting, with substantial results. Exploration and mining in the Erdunte region, where Mongolia's massive copper and molybdenum deposits are located, has been going on for twenty years, which constitutes the greatest achievement of Mongolian mining development and of Mongolian-Soviet cooperation. The copper and molybdenum produced there accounted for the largest share of foreign currency earned by Mongolia, and were one of the pillars of its economy. Since the 1960s, Mongolia has explored more than five hundred sites for mineral deposits and apparent deposits, among them rare and precious metals, ferrous metals, coal, and precious stones. Mongolian geologists have produced geological maps of varying scales. Another important achievement of the country's geologists and geographers is publication of the *Atlas of the Mongolian People's Republic*, which consists of two principal parts: 'Natural Conditions and Resources,' and 'The National Economy'. The Atlas is 144 pages in length, and contains 276 maps and charts, systematically analyzing Mongolia's natural geography, economic geography, and political geography.

In the field of space exploration the Mongolian astronaut Gurragcha successfully participated with Soviet counterparts in a 1981 space study mission.

In the social sciences, Mongolian scientists have carried out extensive research on their country's history, language, literature, philosophy, and economy, and have published numerous monographs and books, such as *The General*

*History of the Mongolian People's Republic, Ethnology of the Mongolian People's Republic, Modern Mongolian Language, Modern Mongolian Grammar and Phonetic Structure, Young People's Encyclopedia, Comprehensive Dictionary of Mongolian Customs*, and so on.

Mongolian literature flourished during the 1940s. The major achievements consisted chiefly of works praising the Mongolian people's patriotism during the Second World War and the friendship between Mongolia and the Soviet Union. In the 1950s, Mongolia published its own full-length novels *The Dawn* and *In Altai*, marking a new stage in the development of Mongolian literature. In the 1960s, the novels *Crystal-Clear Tamir River, Years of Turmoil, Mountain Torrents, Mobile Seats, A Great Destiny* and *The Clatter of Hoofs* were published, as well as collections of poetry by Gaitabu, Yawuhulang and Puribudaorji. Among these the most popular was *Crystal-Clear Tamir River* by Luodaidanba, which vividly and movingly depicted the panorama of life and customs in Mongolian society during 1920s. Since the 1940s, Mongolian drama has evolved briskly; many richly themed works have been staged, including the historical plays *The Wise Mandu Sea Queen, Arquirshana*, and *The Khan of Shalai River. The Birthday* and *Brothers* depicted the joint Mongolian and Soviet struggle against Japanese militarism in the Second World War; and others reflected the life of the Mongolian people after the war. In the 1940s, Mongolian cinema was predominantly aimed at promoting patriotism.

Mongolian efforts in medicine and health care also developed apace. In 1960 there were 630 hospitals and clinics, equipped with 8,303 hospital beds. These figures had increased greatly by 1980, at which time Mongolia possessed 2,541 hospitals and clinics, and 16,503 hospital beds, and the basic level of health had reached a relatively high level.

### Since 1991 – the impact of economic crisis on Mongolia's science and culture

After the collapse of the socialist system and disintegration of the former Soviet Union, trade declined sharply from 1989 to 1993. Since August and September 1990, Mongolia's economic condition has steadily worsened. For example, the gross national product for 1991 was down by 16.1 and 12.8 per cent from 1989 and 1990, respectively; the industrial output fell by 16.7 and 11.7 per cent; agricultural output (including animal products), fell by 6 and 2.4 per cent in the same period. In 1992 the Mongolian economy continued its downward slide.

The declining market for cultural production, a shortage of funding for scientific research and stagnation in educational progress, were increasingly evident. To take education as an example, in 1991 the number of school drop-outs reached 20,100; only 11 per cent of planned school construction was finished and the opening of 109 schools was delayed. About 45.5 per cent of kindergarten buildings were serving purposes other than those for which they were meant; while another 22 per cent was in danger of collapse. Schools and kindergartens in rural areas were short by more than 430 teachers. Since 1994 however, the economy has rebounded somewhat, showing a growth of 6.3 per cent in that year, but the task of recovering lost ground in cultural and scientific development remains critical.

## CENTRAL ASIA

Between the seventeenth and nineteenth centuries, the socio-economic situation in Central Asia had hardly changed at all. The feudal age continued even as capitalist relations were taking root in society. A peculiar feature was the combination of essentially feudal economies with patriarchal social relations that coexisted with many remnants of tribal forms of living. The tribal form was actually a legal fiction disguising private ownership of land and cattle. Feudal ownership was combined with a small centralized state having little internal unity. Exploitation and arbitrary rule increased from year to year. Feudal rents were becoming more and more ruinous. The system of granted land estates and *waqf* property – an Islamic legal term for land dedicated to religious purpose – were helping the feudal ruling class to maintain their wealth. A slave trade had existed everywhere since ancient times, especially in Bukhara and Khiva. Arminius Vambery, a nineteenth-century scholar and traveller, informs us that there were 20,000 slaves in Bukhara alone. Class differentiation was rather significant. The intermediate producers and the peasants were exploited by the state through imposition of *kharadj*. In Bukhara, for example, an extraordinary war tax was levied at the same time as many other duties. Abuse on the part of the ruling class caused a great uprising among the Kipchak population in 1821.

In some cases, when arbitrary rule and coercion became intolerable, in particular on the part of Khiva and Bukhara authorities, groups of Turkmen migrated to the Astrabad region, and Tadjiks and Uzbeks went to Afghanistan. The northeastern borderlands of the khanate were populated by Karakalpaks, who had settled here along the Amu Darya river in the early nineteenth century. The economy was based on agriculture and cattle-breeding. Here Uzbek feudal lords had dominated the landless populations, and played an important part in the social and political life of the Khivan khanate. Military conflicts between Bukharan and Khivan Khans were frequent. A Turkmen tribe, the Yomuts, was a principal force in the Khivan invasion. The Karakalpak population, left without military assistance from the Bukharan emir, had to submit to Khiva in the first decade of the nineteenth century. Khan Mohammed Rahim occupied a rather important place in the Khivan khanate in the first half of the nineteenth century. He succeeded to a large degree in centralizing the state and strengthening central power. After several wars he captured the Aral regions and also undertook several campaigns against Kazakhs. Merv, an important Turkmen centre, submitted to Khivan power in 1822. This all resulted in significant expansion of the territory. The new evolving state was largely dominated by the clergy, who enjoyed certain privileges. Its armed force was principally represented by *noukers*, whose occupation was to run either before or after the mounted horseback riders. Half of all cultivated lands belonged to the Khan and his relatives; the clergy, the merchant class and general population were considered legal tenants. A land tax was paid in money and in kind. Turkmen, Karakalpaks and Kazakhs suffered most from these taxes, and the number of slaves was significantly greater than in neighbouring feudal states. Arbitrary rule and violence had caused an uprising headed by Er Nazar, a Karakalpak chief, whose heroism will remain forever in the history of the Karakalpak people.

Up to the end of the nineteenth century certain unification trends were becoming visible among heterogeneous population groups of the Fergana Valley under the Khan Umar (1809–22) and his successor Madali-khan (1822–24). The city of Kokand had appeared earlier in the Fergana Valley, in the middle of the 1700s, surrounded by densely populated areas. Nobility, the owners of large land estates, dominated the region with its settled population. In the 1800s political domination shifted to Fergana hojas, who concentrated political power in their hands for some time. The second ruling group consisted of middle landowners who remained the mainstay of state power and also commanded the armed forces of the khanate. The highest ecclesiastical dignitaries, represented by *qadis* or judges, as in Bukhara and Khiva, held responsibility for general supervision over activities of the clergy. Local historian Mohammad Khakim believes there were as many as 40,000 officials in Kokand. Just as in the neighbouring states, owners of *waqf* possessed great financial means. The *kheradje* was a principal tax imposed on the great number of landless peasants who were also obliged to rent land. Their earnings with small parcels were very low and they often substituted their labour in place of cash levies. Peasants were legally free, but as a result of indebtedness to the state as well as general economic dependence on large landowners, they were not free in practice. The Kipchaks maintained a traditional patriarchal kinship system with strong tribal chiefs. The nomadic population, especially Kirghizes of Kokand khanate, preserved the khan's charters confirming possession of their lands.

As to culture and education, there were schools of two different kinds in this part of the Islamic Orient. *Maktabs* were primary schools where children from the age of 6 to 15 years received their education. A graduate was expected to know the basic obligations of a Muslim and understand the religion's dogmas. Lectures were read in Arabic and Farsi languages. In larger cities, separate schools for girls also existed, with a reduced curriculum. Similar schools functioned among nomadic Kirghiz, Kazakh and Turkmen populations. The higher-level Muslim schools were called *madrasas*. These were also confessional, and their curriculum was based mainly on scholastic theology and the *Sharia* as well as Muslim canonical law. Educational institutions were maintained from incomes on *waqf* lands and other property. For the most part, both *maktabs* and *madrasas* were concentrated in large cities, especially in Bukhara, Samarkand and others. Education was entirely in the hands of the clergy, and the level of knowledge was generally low.

Notwithstanding this, Bukhara *madrasas* attracted many people not only from Central Asia, but also from the Volga regions and Orenburg. Since ancient times Bukhara had enjoyed a reputation as a holy city and also as a centre of sciences and education.

All in all, the central cities, best typified by Bukhara and Samarkand, are of the greatest historical and cultural interest. *Madrasas*, which played a significant part in the life of this region, gave to the world such famous thinkers as Al-Biruni, Avicenna, Nosiri Khosrov and many others. Such splendid monuments as the Samanids Mausoleum (ninth century) in Bukhara, the Kalyan mosque and Miri-Arab *madrasa* (fifteenth century), Baland and Hoja Zainuddin mosques (sixteenth century), and the great mausoleums of the Shah-i-Zindah, Bibi-Khanum and Gur-Emir are known throughout the world.

Together with official theology, Sufism with its dervish orders also played a significant part here, with Timur's contemporary Hoja Bekha-ud-din the most prominent Sufi. The Central Asian writer Sadriddin Aini once remarked about these splendid monuments: 'magnificent and luxurious from their facades, cramped and uncomfortable inside, these buildings seem to reflect the hypocrisy, hostility and outward splendor of the feudal age'.

Towards the end of the eighteenth and beginning of the nineteenth century, certain progress in market relations was becoming visible. Some individuals concentrated not only on large land estates but also on trading and managing artisan enterprises. At the same time feudalism was a brake on such developments. The population at large and those in cities found that economic ties were severed or made difficult by the borders as well as by intermittent clashes and wars among the three large khanates.

The feudal khanate was a little centralized state. Exploitation and feudal arbitrary rule were increasing from year to year. In Bukhara, a new bazaar levy, the *aminona*, was introduced, and Emir Nasrulla introduced a *yarga* tax and forfeiture of property. In 1859 all this resulted in a civil war, with Kazakhs, Karakalpaks and Turkmen laying siege to the Kungrat dynasty capital. In the second half of the nineteenth century British imperialism in Central Asia was at its most aggressive. At the same time, Czarist government policy in the region was being dictated by the colonial ambitions of Russian capitalists seeking foreign markets, and by its strategic situation. Sometimes the conquest was by force, but in other cases it took more peaceful forms.

In 1861, Orenburg's Governor-General drew up plans for capturing Turkestan and Tashkent. Two detachments were sent, one commanded by Colonel Mikhail Chernyayev, and another under Colonel Nikolai Aleksandrovich Veriovkin. In May 1864 Chernyayev stormed and captured Aulie-Ata, and Veriovkin captured the large cultural centre of Tashkent. In September 1864 Chernyayev began siege of Chimkent, which at that time was subjected to Kokand khanate rule, and captured it after several clashes with Kokand troops. In October 1865, Chernyayev reached the fortress of Niez-bek, where he defeated Bukharan troops and captured Tashkent. To accelerate the conquest, General Romanovskii was detailed to Turkestan to succeed Chernyayev, who continued his offensive against the Bukharans. Khodgent fell to the Russians, as did Ura-tiube, Samarkand and Kokand. Meanwhile Emir Muzaffar proclaimed 'holy war' against the Russians. But he lost the battle of Djizak on the approach to Samarkand and Russian troops continued their offensive into the Bukharan territory. Up to this time the Turkestan Government under General Konstantin von Kaufman was established on land conquered since 1847, with Tashkent as its centre. In the summer of 1868 a peace treaty was concluded between Russia and Bukhara, leaving the latter a vassal of Russian Czarism. In the spring of 1870 Russian troops occupied all the territory along the Zeravshan River and invaded Khiva, which was captured the same year by Russian troops commanded by von Kaufman. Then Russia seized the opportunity provided by an uprising in the Kokand khanate and conquered the whole of it in 1876. The road was open for further movement toward Turkmen territory, particularly Kizyl-Arvat and the western part of the Akhal-Teke oasis. A new expeditionary army, headed by General Mikhail Skobelev, was formed in 1881. Skobelev immediately moved his troops

against Geok-Tepe, and on 28 December engaged in a famous skirmish that ended in hand-to-hand combat. On 12 April 1881 the fortress of Dengil-Tepe was stormed and taken, and Ashkhabad surrendered some time later. The fate of the Turkmen was finally decided. On 6 May 1881 the Trans-Caspian Province, which included newly conquered regions, was established with Ashkhabad as its centre. In 1887 a new northern border was drawn between Russia and Afghanistan up to Zarkul lake. Khiva, like Bukhara, was declared a vassal of Russian Czarism.

After the conquest was completed, the peoples of Central Asia and Kazakhstan lost their independence and from then on lived in a state of political disintegration.

In the wake of the October Revolution, a wave of revolutionary fervour swept the whole country, including Central Asia – Kazakhstan, Uzbekistan, Kirghizstan, Tadjikistan and Turkmenistan. Faced with radical changes, these tradition-bound peoples were able to achieve great success in industry, agriculture and culture during the twentieth century. Often their successes were rooted in friendship between peoples and the mutual assistance inherent in the social life of the country. Guided by principles of international solidarity, the international community has also played an important role in the daily lives of people in Central Asia.

After 1917, the equality of nations and the equal right of national minorities to freely develop in their own way became a reality, and everything was done to improve their economic and cultural level. Full equality of women and freedom of conscience were recognized, while the remnants of the old society were suppressed. The People's Commissariat of National Affairs was established after the Fifth All Russia Congress of Soviets in 1918, with the purpose of promoting all possible measures for cultural development and class-consciousness.

In 1918 the Turkestan Congress of Soviets confirmed recognition of the local language as a state language, and decided to publish literature in all local languages. A great effort was made to expand the network of general education schools, to offer courses for protection of cultural heritage and historic monuments, and to create a Soviet press that would publish literature in local languages. Commissions were set up to eradicate adult illiteracy, which was the greatest brake on economic progress and cultural revolution. By 1924–25, literacy in Turkmenistan alone had already increased 4.7 times as compared with 1920. Organization of Soviet General Education began to provide schooling for children without distinction of age, nationality or religion. Short teacher training courses appeared in Turkestan and Kazakhstan to train teachers for the national and primary schools. Some time later similar schools were opened among the nomadic and semi-nomadic population. In 1920, 35 Turkmen schools opened in Poltoratsk Uezd (district), with 1,500 boys and girls of all ages. During the first three years of Soviet power in Turkestan the number of schools opened each year averaged 75, five more than during the fifty years of Czarist domination.

At the same time, out-of-school education was rapidly progressing for all strata of the population. For example, there were 17 such schools in Przheval'sk Uezd of Kirghizia. Because of classroom shortages for nomadic peoples, some schools opened in yurts. In 1918 the school reform in Kirghizia was completed, and consolidated labour schools replaced the former estate schools. New requirements and new methods were introduced for both Russian and indigenous pupils, due in part to the influence of the First Congress of Popular Education of Turkestan, held in 1918. In September of the same year a similar congress took place in the Bukei Horde in Kazakhstan.

On 21 April 1918 the Turkestan People's University was opened. In September 1920 the Central Asian University in Tashkent was founded, and many of Russia's best scientists and scholars came there to teach.

Political news and opinion was provided by central organs like *Pravda* and *Izvestiia*. In Tashkent, *Nasha gazeta* (Our Newspaper) appeared for the first time on 2 April 1917. Later, publication of republican newspapers started, *Izvestiia Tsik, I Sovnarkoma Turkestanskoi respubliki* (News of the Central Executive Committee and the Council of People's Commissaries of the Turkestan Republic), *Krasnoarmeets* (Red Army Soldier) and *Golos Krestianina* (Voice of the Peasant) among them. In June 1918, the first issue of an Uzbek-language newspaper was published. Newspapers in Tadjik and other languages of the peoples in Central Asia followed, as did new locally produced magazines.

One of the greatest successes was the emancipation of women in Central Asia, which was seen as an essential part of the proletariat's struggle for its liberation. There were many obstacles due to vestiges of feudal and patriarchal societies, total illiteracy of the population, and such traditional customs as obligatory wearing of the *paranja* (veil), and arranged marriages of teenage girls. It is in these years that many oppressive practices against women were put to rest.

From October 1917 to March 1918 the Soviet power marched triumphantly through Central Asia and Kazakhstan. Turkestan joined the RSFSR as an autonomous republic. It included all of Turkestan within its geographic borders excluding Khiva and Bukhara. The bulk of the population consisted of Uzbeks, Kazakhs, Kirghizes, Tadjiks, Turkmens and Karakalpaks. The idea that power belonged in the hands of workers and poor peasants provided strong revolutionary motivation for the toiling classes of Khiva and Bukhara, where semi-feudal regimes still existed. But they were resisted by the Bukharan and Khivan khanates, who were hostile to reforms undertaken in Soviet Turkestan and Kazakhstan.

In February 1920 a great uprising against the feudal regime of Djunaid-khan began in Khiva. Local progressive intellectuals turned to the government of Turkestan and to the Turkestan Commission for support. Russian revolutionary troops defeated Djunaid's bands and Soviet power was established in the city.

In April 1920 the first All-Khivan Kurultai (council) of people's representatives was convened in Khiva. It proclaimed the Khivan khanate abolished and inaugurated the Khorezm People's Soviet Republic (KhPSR). In 1921 the Soviets deposed the young government of the People's Republic of Khorezm, later replacing it with the Khorezm Soviet Socialist Republic (SSR), and also abolishing the voluntary incorporation of the respective ethnic regions of Khorezm into the Turkmen SSR, the Uzbek SSR and the Karakalpak Province (Karakalpak Autonomous Soviet Socialist Republic since 1932). Meanwhile, a revolutionary crisis was brewing in Bukhara. On 6 September 1920 revolution broke out and the Emir fled. On 6 September 1921 the All-Bukharan kurultai adopted the Constitution

of the Bukharan People's Soviet Republic (BPSR). These popular-democratic revolutions in Khorezm and Bukhara were brilliant proof that it was possible for some traditional peoples to pass to socialism directly without passing through a capitalist phase. Trained personnel were scarce, and the old intelligentsia was widely employed when available. Nevertheless, the process of attracting the old intelligentsia to the side of Soviet power was slow and irregular, and a big effort was made to train new personnel in keeping with the new spirit.

There were many different levels of development among the peoples of Central Asia. Some peoples possessed a bourgeois intelligentsia, while the others did not. Representatives of other nationalities and groups, Russians, Tatars, Jews and others, were employed in leading industries of the national economy together with representatives of autochthonous nationalities. The central educational institutions in various branches of science in large cities played a major part in training highly skilled professionals. Such institutions as the Institute of Red Professorship, the Communist University of the Peoples of the Orient and others also helped develop leadership for the national republics, while other institutions, from *rabfak* (workers' faculties) to the largest educational institutions in big cities like Moscow and Petrograd trained personnel for local teacher training colleges. In the early 1930s teacher training institutes and universities were opened in many republics of Central Asia and Kazakhstan, and specialized medical, agricultural, and veterinarian institutes started functioning in the Asian capitals. Highly skilled specialists were invited from other republics to help out, and they rendered great service in developing national capacity. Large industrial enterprises began to appear on the base of pre-revolutionary handicraft shops. Up to the time of the national-state delimitation in 1924, literacy rates in Uzbekistan alone had increased more than three-fold. As early as 1926 there were 913 general education schools in Uzbekistan with more than 77,000 pupils, and two higher education institutions in Tashkent and Samarkand. By 1938 there were 30 higher education institutions in Uzbekistan with 15,600 students. By the late 1920s and early 1930s it was becoming necessary to centralize research, management, education and planning around single centres. In Turkmenistan, formerly a very weak republic, such a centre was established in 1927 to unite all branches of science. At this time, a planned and concerted research effort to explore the Kara-Kum Desert began in Turkmenistan.

In October 1940 the Turkmenistan branch of the Academy of Sciences of the USSR was founded. Special attention was paid to making more rational use of desert pastures, and new forage plants of the cotton family with higher albumin contents were introduced.

The first conference devoted to natural resource problems of Tadjikistan took place in Tashkent in 1925. Its objective was to initiate a comprehensive study of natural resources and cultural heritage of the Tadjik people, beginning with research on the physical geography and economy of Tadjikistan. In the same year, two research expeditions conducted geological surveys and collected anthropological and linguistic materials.

In 1928, an expedition to Pamir was organized jointly with German researchers. This expedition resulted in the discovery of several glaciers and névé fields in the northwestern corner. In 1930, the USSR Academy of Sciences held a conference on geological and surveying work in Dushanbe. In 1931, the first congress on non-ferrous and rare metals took place in Khodzhent, and in 1933, the Academy of Sciences organized a conference in Leningrad devoted to modes of energy production and industrialization in Tadjikistan.

Great changes were occurring in the republic. If there were only 60 industrial enterprises in Tadjikistan in 1932, then this number had increased to 209 in 1937. A metalworking industry was created, and a machine production and repair facility was constructed in Dushanbe. Besides cotton-cleaning plants, there was silk-processing, leatherworking, and garment-making.

On 14 April 1951 the Academy of Sciences of Tadjikistan was established, which played an enormous role in furthering development of science and culture in Soviet Tadjikistan through economic growth and better management and use of natural resources. From 1 January 1945 through January 1946 more than 20 new industries became operational. By the 1960s, the construction and transportation industries were developing vigorously. Later enterprises included an oil and fats plant, a carpet-making plant, textile manufacturing, electrical equipment, and a mining and mineral extraction plant in Adrasman. Industry became the backbone of the republic's economy. Goods manufactured in Tadjikistan were exported to many other countries. Great attention was also paid to development of cotton plantations in the Vakhsh Valley, construction of irrigation canals, reclamation of uncultivated lands, construction of power plants, and development of such varied scientific disciplines as seismology and gastroenterology. The principal goal was always to accelerate the rate of technological progress.

These successes would not have been achieved without the support and assistance of the more developed republics in the Soviet Union. In 1924, the Kara-Kirghiz Autonomous Province was constituted within the RSFSR (Russian Soviet Federated Socialist Republic). This significant event brought the first statehood to the Kirghiz people and in December 1936 it became a Union republic. In August 1954 the Academy of Sciences of the Kirghiz SSR was founded as a branch of the Academy of Sciences of the USSR. Originally, the Academy consisted of the Institutes of Geology, Botany, Water Resources and Energy Technologies, Zoology and Parasitology, Regional Medicine, History, Language and Literature. In 1956 the first scholarly works on the anthropology of the Kirghiz people were published. The same year saw publication of a two-volume *History of Kirghizia*. These Highland cattle-breeders from ancient times had their poets and singers like the famous Toktogul (1861–1933). The vast spiritual heritage was passed from one generation to another through the epic *Manas*, which contains more then a million lines of verses and is 20 times bigger than the *Odyssey* and *Iliad* together. It appeared more then a thousand years ago and sings the tale of the legendary Kirghiz hero Manas, giving a history of the people. In 1958 sub-disciplines on materials science, philosophy, and several laboratories were added in the Institute of Economics. From 1964 to 1979 new departments of physics, mathematics, chemistry and life sciences were established in the framework of the Academy of Sciences. By the beginning of the 1990s more than 1,200 researchers worked in the Academy, which was playing a leading role in national development. Great successes were achieved in seismology, especially with regard to techniques of seismic mapping.

Scientists and engineers from several research institutes of the Academy of Sciences of Kyrgyzstan carried out extensive geological, climatological, geographic and seismological studies around the Aral Sea and Lake Balkhash, and the construction of water reservoirs was planned. Engineers there analyze and test the best methods of building dams in the mountains in Kirghizia, Tadjikistan, Armenia and Georgia. Scientists in Kirghizia also do significant work on fine-fleeced sheep-breeding (there are 12 million of such sheep here), which attracts very large investments.

The high and powerful Tokhtogul dam is situated on Kirghiz territory, as is the dam of the Nurek power plant, a unique engineering work, situated in the southern highlands. Construction of these dams seemed to offer proof of the great potential of socialism and of the friendship of peoples. The Nurek dam is also recognized as being the world's first installation with a high head of water to be constructed within the grade 9 zone of seismic activity.

The USSR Academy of Sciences played a tremendous part in fostering scientific development and establishing satellite academies throughout the Central Asian republics. In their turn, the academies achieved prominence in selected fields within the broader system.

In August 1920 the autonomous Kirghiz (Kazakh) Soviet Socialist Republic was constituted within the RSFSR, with its capital in Orenburg. The republic included regions with predominantly Kazakh population around Semipalatinsk and Aktiubinsk. Later some territories were transferred to Kazakhstan. Grouping of Kazakh lands under a single authority made it possible to constitute a Union republic, with the capital in Alma-Ata.

Kazakhstan scientists achieved much in Earth and metallurgical sciences, mining, biology, molecular chemistry, astrophysics and social sciences. The country serves as a good example of the importance of fundamental research. Thanks to research in the social sciences, many economic, ideological, social and legal problems were resolved, including issues touching on spiritual culture, language, literature and art. In the prewar years, more than 2,580 large industrial enterprises were operating in Kazakhstan. At the same time secondary and higher education institutions were created in many specialized fields like teacher training, medicine, and veterinary studies.

Kazakhstan and Uzbekistan differed from the other republics of Central Asia by the size of their population and area, as well as by their wealth of internal resources. Kazakhstan possessed great masses of cultivated land, while Uzbekistan had great cotton fields in addition to its industry. Crops from these republics not only supplied the USSR but were exported to foreign countries. Successful economic and cultural development of these two republics was promoted not only by assistance and support from the Soviet Union but also by the presence of large numbers of people of Russian origin. As a whole, internationalism was always a distinctive feature of the Central Asia population, and they flourished especially in the years following the Second World War. Kazakhstan State University in Alma-Ata was a major institutional force in the region's development. Scientists in Central Asia conducted joint research on the area's natural and social resources. They prepared topographic maps of southern Tadjikistan and at the same time studied nuclear physics and space rays. The USSR Academy of Sciences coordinated and determined the main directions of research done by the national academies. Up to the 1970s the number of scientific personnel in Kazakhstan exceeded 11,300, with 4,400 of them involved in research. Along with great scientific and industrial successes the republic made great strides in agriculture. Cultivation of the virgin lands began in this period and there were great harvests of grain. In Turkmenistan, after its Academy of Sciences was founded in 1951, there were 41 functioning scientific institutions with 656 Doctors of Science.

Scientific research and cultural development were also promoted through conferences to discuss large-scale projects and economic prospects. Construction of Turkmenkanal (Turkmenian Canal) to the Amu Darya River, a tremendous project, was an invaluable incentive for development. It made possible reclamation and cultivation of the Kara-Kum Desert, construction of new cities with large populations and gardens, and the beginning of cotton-growing in these areas. Turkmenistan is now an important supplier of oil and gas, as well as a great industrial and cotton-producing region. The republic possesses universities and institutions for medical, agricultural, pedagogical, and polytechnic training, and other higher and secondary educational institutions. During the Great Patriotic War (the Second World War), Tashkent, Alma-Ata and other cities became not only bases for enterprises evacuated from Russia, Ukraine and Belarus, but also centres for relocated scientific institutions. Many great specialists were brought in along with the plants and factories, a process that facilitated training of national cadres from among gifted young people. Local research institutions began publishing works on the history of their peoples with the help of Russian and Ukrainian scholars, thereby strengthening friendship between peoples and giving a new impetus to internationalism. With the help of the USSR Academy of Sciences, new scientific institutions were established in larger cities. Uzbekistan scientists, for example, were well known for their work in nuclear physics, solid-state physics, mechanics and seismology. Fundamental research was especially successful and proved increasingly useful in developing new technologies and materials, instruments and equipment. For the first time scientists successfully predicted an Earthquake in the Alai Valley in 1979 and were accurate to within a few hours. More than 600 foreign scientific delegations visited Uzbekistan alone and 39 international symposiums were held there.

As to other neighbouring republics, Tadjikistan should be credited with notable scientific successes, built on continuing advances in the disciplines established from 1959 to 1972: astrophysics, seismology, organic chemistry, biology, mathematics and physics. In humanities, the histories of the peoples of Central Asia were published in all republics beginning in the 1950s. Contacts with various scientific centres and organizations greatly expanded. For example, the Tadjikistan Institute of Chemistry studied brown coal deposits in the Uzbek and Kirghiz Republics. The Institute of Biophysics and Physiology of Plants discovered several new species. The Gissar Observatory made high-precision measurements of space stations *Mars 3*, *Luna 181* and *Luna 191*.

The growing prosperity of people in the USSR boosted the mass media there; more than 180 million readers of all nationalities can read printed works in 89 different domestic languages and 56 foreign languages. In 1914 there were no general libraries in Uzbekistan, Tadjikistan, Kirghizia,

Turkmenistan and Kazakhstan. Now each of the republics possesses public libraries with great collections of literature. In 1972, some 1,398 public libraries in Kirghizia kept 12,038 thousand copies of books and magazines. In Uzbekistan, the number of libraries had increased from 3,418 in 1960 to 5,909 in 1972, and their collections grew from 18.4 million to 34 million volumes; for the Tadjik SSR, the respective figures are 884 and 1,242 libraries and 4.9 million and 8 million volumes, for the Turkmen SSR 1,168 and 1,185 libraries and 560,000 and 6.9 million volumes.

Uzbek, Tadjik, Turkmen and Kazakh literature has achieved extraordinary heights. Already in the prewar period, contemporary literature was making inroads and writers and poets such as K. S. Aini, M. Aibek, Mirzo Tursunzade, G. Guliam, V. Kerbabaev, Chinghiz Aitmatov and others became well known even abroad. In recent years many talented artists of the former Union republics have also received international attention.

Each republic was proud of its culture and achievements and each nation and nationality had always preserved its peculiar features, national character, language and traditions. Soviet culture and science embraced all the best features. Soviet literature and art constantly reflected the unity of international and national themes, especially when describing social processes and issues.

With each year international contacts were strengthened and joint research with outside institutions increased, especially with those in Eastern Europe. Young people from the Middle East, Africa and Latin America came to study in Central Asia. The bonds of local unity and cohesion were very intense, a sense of solidarity that was well demonstrated during the hard times of the Second World War. Coming back to the present, all countries have witnessed changing priorities in fundamental and applied sciences as market relations play an increasing role in determining the speed and nature of technological renewal. As market conditions are applied to science, priorities set through competitive selection will decide which projects are implemented.

In recent years, the reform process in Central Asian countries of the Commonwealth of Independent States (CIS) has been gradually expanding. In Kazakhstan, for example, quantitative and qualitative changes are actively under way. The crisis in the chemical and energy industries has now stabilized and since 1994–95 the main emphasis has turned to better management of the republic's own resources, a balanced budget and less dependence on foreign loans. The pace of change and reform is different in each country, but the process is the same.

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# OCEANIA

## Roy Macleod

## INTRODUCTION

Fifty years ago, on 6 August 1945, a B-29 of the US Air Force called *Enola Gay* took off from Tinian, a tiny island in the northern Marianas, and dropped the first atomic bomb on Japan. Following Hiroshima and, two days later, a second bomb on Nagasaki, the Pacific War came to an end. A prodigious fear of Western science and technology had helped curtail the world's most costly war. This moment – of lasting global significance – marked also a moment in regional narrative, a dramatic instalment in a long history of Western science and practice, which had for centuries made a laboratory of the Pacific. From Magellan's voyage round the Horn in 1520, to the American sortie from Micronesia, the Pacific had become a contested space for discoverers and explorers, missionaries and colonizers, naturalists and anthropologists. First sighted by oceanic navigators from the Indonesian archipelago around 20,000 BC and settled by 1000 AD, the region we now call Oceania became, by the nineteenth century, a tropical necklace of colonies – and as such, projections of Europe. Its places, its peoples have inspired Western art, science, literature, and scholarship. At the close of the twentieth century, the future of the Pacific cannot be understood without an appreciation of its past and those factors that have shaped its present.

That present is now viewed with an insistent eye. Today, fifty years after the end of the war, the island nations of Oceania, and the countries of Australia and New Zealand, reveal a history of settlement and assimilation of Western culture – separated in many respects from Asia and the civilizations of the Pacific Rim. Within these fifty years, however, has emerged a sense of political and cultural independence, which is testing historical relationships with the superpowers and the cultural assumptions of the West. This fact alone has obliged the world to take an increasing interest in the region, and its Rim, on the eve of what is heralded to become the 'Pacific Century'.[1]

## OCEANIA AND ITS PLACE IN THE WORLD

In the map collection of the National Library of Australia, 'Oceania' first appears on the map by Abraham Ortelius,

entitled Maris Pacifici, dated 1589. It is the name now given to the many islands – geographers estimate between 20,000 and 30,000 – that are scattered on a line 17,000 km across the south and central Pacific, an ocean that covers a quarter of the world. Some of these islands are thousands of square kilometres; others are mere volcanic peaks barely visible above the water. The population of the region now comprises 8.5 million people, shared among nine nation-states, of which Papua New Guinea is the largest, with 70 per cent (4 million), and Niue is the smallest (ca. 2,500 in 1991). There are also three French overseas territories, French Polynesia, New Caledonia, and Wallis and Futuna, and two self-governing states (Niue and the Cook Islands) in free association with New Zealand. In 1994, the population of the islands was 80 per cent indigenous, and all are experiencing a high rate of population growth (2.2 per cent) in 1994. The name 'Oceania' was popularized in the 1840s by French geographers after the early French explorer, Jules Dumont d'Urville, to designate the three islands groups – that is, Melanesia (Black Islands), which stretches from New Guinea, Palau and the Marianas on the west to Fiji in the east; Micronesia (Little Islands), a string extending north of Melanesia and west of Polynesia; and Polynesia (many islands), reaching from Hawaii in the north to New Zealand and Easter Islands in the South.[2] Australasia, which variously has also meant Australia (with or without Tasmania) or Australia and New Zealand, is considered geographically and culturally separate.[3] Both will be discussed in this chapter.

Archaeological evidence indicating successive waves of human migration east and south – from the Indonesian archipelago to Australia and New Guinea, upwards of 60,000 years ago, and to the islands of the Pacific in the last 5,000 years – continues to be the subject of intense scientific debate. These cultural migrations brought many plants and animals new to the region, so beginning the long history of the Pacific as a 'laboratory' for human experimentation. The Austronesian family comprises between 600 and 1,500 languages, spoken from Malaysia to Philippines, to which must be added more than 800 languages in Papua New Guinea (PNG), so the region became a fertile area for European anthropological and linguistic research. Melanesia today has approximately 1,000 languages, and the other two groups have 100 more.[4] The region's diversity is emphasized

by its isolation and difficulty of access. The mountainous parts of PNG were daunting to European explorers in the nineteenth century, and remain almost impenetrable to outsiders today, while many islands in the central Pacific are visited by few creatures other than migratory birds.

## EUROPEAN EXPLORATION AND COLONIZATION

The European presence in the Pacific began in 1513, with Spanish sightings of the Pacific, and with Magellan's voyage in 1521. East of Timor, Spain consolidated its empire in the North Pacific, while in the south, Portuguese and Dutch explorers traced the outlines of New Holland. But it was not until the eighteenth century that Europeans made their presence felt among the indigenous inhabitants of the 'south seas'. Between 1760 and 1810, French and English navigators, including Louis Bougainville and James Cook, systematically charted and surveyed the southern ocean, New Zealand, and the eastern and southern coastlines of Australia. European navigation was accompanied and made possible by the nautical applications of science and systematic cartography, and celebrated in the collection of data, artefacts, and specimens of flora and fauna – 'tools of empire' that contributed to educated Europe's map of the world.[5]

European collectors established the Pacific as a paradise of natural diversity, and following the experiences of Cook and Sir Joseph Banks, there were repeated private, naval and government expeditions.[6] But if Western science gained vastly from its contact with the Pacific, indigenous cultures preceded European contact with a range of local knowledge systems, which comprehended natural history, celebrated formalized art and sculpture, inspired mathematically patterned basketry, intricate weaving and adaptive architecture, and called upon an extensive knowledge of weather, currents and winds in the practice of inter-island travel and trade. Measures of time were applied to agriculture and fishing, while experience brought a range of local knowledge of soils and vegetation, fauna, topography, and the medicinal uses of plants. Polynesians are masters of wood and stone carving, Melanesians are known for their elaborate totemic art, and Micronesians, for their functional use of natural materials. Australian Aborigines have developed complex belief systems and a highly adaptive understanding of local ecology and environmental management. In the twentieth century, these have become reservoirs of cultural and artistic inspiration for Europeans and indigenous peoples alike.

European colonization brought new languages, particularly English and French, to Oceania, as well as a range of customs, employment practices – and diseases – unfamiliar to native peoples. From the nineteenth century, contact not infrequently produced a 'fatal impact' in the form of death, depopulation and dislocation of traditional village life.[7] Private and government-sponsored expeditions led to overseas knowledge of places and peoples, while colonial administrators documented flora, fauna and mineral resources. Europeans established cities, including Papeete, Suva and Vila, which attracted rural labour and disrupted community lifestyles. 'Balance', it is said, disappeared from traditional village-based cultures.[8] From the early nineteenth century, education was largely in the hands of missionaries, and there was little higher education until after the Second

World War. Literacy rates rose higher in some countries (notably Fiji) than in others, but remain challenging. In Papua New Guinea, two universities were established before independence, but elsewhere, university remains a luxury. Throughout the islands there survives a rich cultural heritage which, if at first viewed unsympathetically by missionaries and officials, in now seen as a special part of the common heritage of humankind.

In Australia, European engagement took different forms. Australia has been described as Europe's geographic 'unconscious', a place of imagined mystery and fantasy, whose native populations were reluctant to deal with Europeans and spoke of their origins in a distant Dreamtime.[9] Darwin found the continent a 'land of contrarieties', and so it remained. Although, from 1788, New South Wales and Tasmania were founded as penal settlements, the antipodean colonies actually served a wide range of British naval, strategic and commercial interests throughout the region. Free immigration to what became Victoria, South Australia and Western Australia conveyed different traditions of settlement. Overall, the European presence, in the words of a noted historian, was 'born to the age of science' and the history of the continent embraced the zealous pursuit and application of science and technology, the observation and recording of nature, and the inventory of natural phenomena.[10]

Like the Pacific islands, Australasia was of interest to European science became of its exotic and unusual flora and fauna, which attracted collectors and afforded specimens to metropolitan museums, zoos, and botanical gardens, and for a position from which to observe the southern skies.[11] Systematic exploration of the region was vital to the resolution of geographical, geological and morphological controversies that had raged for centuries, and for completing and cataloguing the 'map' of the discoverable world. European science drew heavily upon its rich and unusual flora and fauna, and the field sciences, including the sciences of man. The Pacific was drawn into readings of social Darwinism, mirrored in late-nineteenth- and twentieth- century colonial (so-called 'white Australia') policies towards immigration, with their restrictive measures against non-British and non-European (including Aboriginal) peoples.[12]

Both in Australia and New Zealand – where free white settlements followed lines of careful policy – scientific culture emerged more as a cultural given than as an object of policy. Despite the 'tyrannies of distance' from Europe, scientific controversies reflected debates current in Britain and North America.[13] From the beginnings of civic life, and responsible government in the 1840s, colonial legislatures devoted resources to public museums, and to both public and private education, and colonial capitals vied with each other for primacy and participation in intercolonial and international exhibitions. Patterns of colonial scientific enterprise were similar to those found in Britain's earlier 'settler colonies' in North America and colonial institutions in British India – including the exchange of specimens and artefacts, the establishment of local learned societies and journals, and the creation of professional associations – while patronage and reward systems flowed from the institutions of Britain.[14]

Not surprisingly, the cultural world of the colonial capitals of Australia and New Zealand were constructed as similar, if smaller, versions of the leading provincial towns

and cities of the metropolis.[15] In Australia, the first university (of Sydney) was established as a self-conscious adaptation of English traditions, in 1851; and was followed by universities in Melbourne and Queensland; there were four by the turn of the century (and 35 today). Scientific cooperation prompted closer association within New Zealand, among the six colonies of Australia, and across the Tasmania Sea. In New Zealand, the first university was established in 1869 at Otago, and there are now over twenty, together with a sophisticated infrastructure of research institutes, many of world standing.

To the colonist, as to the colonizer, natural science held the virtues of utility, and the circumstances of colonial life encouraged practical work in astronomy, analytical chemistry, and in the 'economic' sciences of botany, breeding, and agriculture, geology and mining. Transplanted Britons introduced current theories, methods and techniques in physics and biology to schools, universities and governments practice. But in the context of 'settler capitalism', less public attention was paid to pure research in the mathematical and physical sciences and, judging from the proceedings of colonial learned societies – established from the 1840s to the 1890s – theory often seemed less rewarding than experience. Australians were easily reminded that early explorers had lost their lives pursuing European beliefs and looking for inland lakes that were not there, or finding river systems that were different from any known in Europe, or Africa, or the Americas.[16]

By the beginning of the twentieth century, a view of colonial enterprise sometimes characterized as 'practical idealism' supported a wide range of invention and innovation. The appropriation and acceptance of new technologies, especially American, was widely applauded. But Australians and New Zealanders also showed a flair for improvization and adaptation that constituted a unique form of innovation producing a remarkable technological history of its own. Local innovations such as the iconic 'stump jump plow', the cyanide process for the extraction of gold, and sea-going refrigeration tended to celebrate practical creativity, and as such were welcomed by the pastoral, mining and agricultural communities.[17] From the gold rushes of the 1850s, if not before, 'Yankee notions' that eased the circumstances of domestic life in the cities or in the bush were assimilated more rapidly than goods from Britain, but active imitation of American industrial manufacturing styles and processes awaited the early twentieth century. Imperial policy ensured that the Dominions, like India, remained primary producers for Britain's industries and markets for her manufactured goods. Economic dependence on overseas investment, and on the primary industries of wheat, wool and minerals, continued to shape Australian life until well after the Second World War. Much the same was true of New Zealand, with its far smaller population and smaller industrial base. Invention and innovation grew from a tradition of importation and adaptation for domestic use, as with the colonial railways, rather than for export.[18]

The early years of this century, which saw the creation of the federated Commonwealth of Australia (1901), saw growing Australian and New Zealand interest in science for its practical value in agriculture – including weather forecasting, crop and soil improvements, and irrigation – and in certain aspects of manufacturing. The First World War – in which Australians and New Zealanders served with Britain's imperial forces in the Pacific, Europe and the Middle East – presented serious economic challenges to both countries. As in Britain, both established new government agencies – the DSIR in Britain and New Zealand, the CSIR in Australia – for the promotion of scientific and industrial research.[19] Through the interwar years, these agencies, together with the universities, placed research in the agricultural and Earth sciences on a firm foundation, and saw their increasing practical application in economic terms. Science (and to an extent, invention) slowly acquired a sense of 'place', a sense that certain laboratory techniques, choices of problem, research strategies and ways of thinking were recognizably 'Australian' or 'New Zealander'. Nonetheless, both countries continued to rely heavily upon British research traditions, and typically sent their best graduates (Lord Rutherford is an outstanding, but not unique, example) 'home' for research training. In the process, both countries lost some of their most able people who, once abroad, would never return.

Through the interwar years, science and technology had a popular following, but given the fact of small domestic markets, imperial preference and tariff walls acted to discourage local innovation and export. The truncated evolution of the Australian motor car industry became a case in point – an excellent machine could not be made profitable in a small market where inexpensive imports could easily seize hold. The consequences of the enormous losses of skilled manpower during the First World War, coupled with dependence on British capital and the effects of the Great Depression, made the 1930s a time of great difficulty for industrial development. Under the circumstances, the establishment of a fundamental research base, and an infrastructure for technological innovation, was long deferred.

## CONSEQUENCES OF THE SECOND WORLD WAR

The Second World War brought many changes to Oceania, Australia and New Zealand, many of which influenced post-war political and cultural events. From September 1939, distant events in Europe had immediate consequences for its colonial possessions in the Pacific. After the fall of France, Noumea and Tahiti installed the Free French Government, and Polynesians were among the Pacific Battalion that fought in the Middle East from 1941. Australia and New Zealand sent men to Britain and a Maori battalion saw service in Greece. At the end of the First World War, Australia had become a surrogate power in the administration of mandates created by the League of Nations for former German possessions in Papua and New Guinea, and Japan had replaced Germany in Micronesia. Now both rushed men to their colonies' defence. Following Pearl Harbor, and the fall of Singapore, the rapid Japanese advance forced heavy fighting on both land and sea, in which the Allies met defeat along a line stretching from Papua to the Solomons, and into the central Pacific.

As Japan occupied the phosphate islands of Nauru and Banaba, and the Gilbert and Ellice islands, native peoples were brought into the front lines as conscripted labour, and suffered appallingly. In PNG, villagers conscripted by the Australians, as one historian has put it, carried the war on their backs. Elsewhere, evacuations dislocated or destroyed whole communities and cultures. Fighting on their own against a powerful invader, when European administrators

had abandoned them, created a new sense of purpose and dignity among islanders, notably in PNG, Fiji and the Solomons, and made impossible any easy return to pre-war, colonial mentalities.[20]

While Australia and New Zealand were never invaded, Darwin suffered heavy and repeated bombardments, while all Australians, experiencing submarine attacks along the coast, feared a planned Japanese invasion, and the country withdrew what troops it could from Europe to make what many saw as an inevitable stand. Following Allied victories in the Coral Sea, and later at Midway, however, the Japanese threat was diminished, and then disappeared, and Australians fought their way back into Papua New Guinea. At home, national independence in economic and industrial affairs, viewed as a momentary exigency during the First World War, became a prominent question during the Second. Australians and New Zealanders, cut off from traditional British manufactures, were now obliged to make good their own, in industries ranging from shipbuilding to aircraft engines. Following the collapse of British power in Singapore in 1942, both Dominions looked to the United States as their principal defender. Between 1941 and 1945, the transit of over three million American troops, with their vast logistic trains, made a lasting impression, and drew Australia, in particular, far closer into the American strategic orbit than ever before, with lasting consequences for post-war attitudes and policy.

The sudden arrival of American forces also transformed life in many of the pacific islands, which became staging posts for the island-hopping counter-attack against Japan. In New Caledonia and the British colonial islands, Americans built a new world of Quonset huts and airfields, tinned food and armoured cars, money and social relationships that symbolically and in practice appealed to the Pacific tradition of gift and exchange. In New Guinea, Melanesian cargo cults assimilated this miraculous wealth within traditional frameworks of religions ritual, in the process contradicting missionary and administrative teachings. As a consequence, the war fortified local traditions, undermined colonial policies, introduced new ideas, ended the myth of European (and Japanese) supremacy, and brought islanders into contact with outsiders. Anti-colonial sentiment grew as assumptions about the permanence and invulnerability of the colonial order collapsed. After the war, Australia assumed a larger role in the region, in the administration of Papua New Guinea, while the British, French and Americans remained in the islands of the central Pacific. The war was a turning point in the history of colonial rule, but its consequences were not to prove as sudden, or as extreme, or as ideological in their character, as those that almost immediately took hold in Africa, India and Southeast Asia. The 'Pacific way', as it would be called, apparently required a different path to independence and development.

In Australia and New Zealand, post-war reconstruction encouraged the development of manufacturing industries and the exploitation of natural resources and trade in natural products. At the end of the war, the populations of both countries were over 90 per cent British by birth. To acquire the labour force needed to build huge projects such as the Snowy Mountains hydroelectric and water scheme, immigration quotas were expanded, and when sufficient British migrants did not come, waves of southern Europeans did. In ways not seen since the gold rushes of the nineteenth century, Australia began to experience the reality of multiculturalism. In the mid-1950s the Federal Government set out to improve facilities at the impoverished, pre-war universities and to strengthen the research base at CSIRO establishments, while in Canberra, an Institute of Advanced Study and research schools were established at the Australian National university to lure distinguished expatriate Australian scientists and social scientists back 'home' and to increase Australia's knowledge of its Pacific neighbours – including Papua New Guinea, whose administration Australia had acquired.[21]

During the 1950s, breakthroughs in soil science, genetics, and irrigation technologies – many of Australian origin – enabled a rapid expansion of agricultural industries, while the wool industries looked for new markets. Driven by new technologies of exploration, and vast private enterprise, a new wave of mineral booms, beginning in the 1950s, continued well into the 1970s. Australia became known, somewhat ironically, as the 'lucky country', and through the 1960s and early 1970s its population enjoyed an enviable standard of living.[22] Continuing a tradition of exploration begun by British and Australian expeditions before the First World War, Australians contributed substantially to the International Geophysical Year in 1957, and to the regime established by the Antarctic Treaty of 1959, which provided for the scientific study of the Antarctic landmass and the southern oceans. The Australian Antarctic Territory, which was transferred to Australia by Britain, and is administered from Canberra, includes almost a third of the 'last continent', and an area almost as large as Australia itself. Over the last twenty-five years, New Zealand has also played a key role in Antarctic Treaty discussions, particularly concerning proposals to exploit the region's marine and mineral resources. Both countries maintain establishments there, which have been models of international cooperation with the former Soviet Union and other treaty signatories.

In the 1950s, following Britain, both Australia and New Zealand courted the prospect of limitless power from nuclear plants, and in the 1960s, Australia participated, often as a proxy for American interests, in some of the more bizarre nuclear projects envisaged by president Eisenhower's 'Atoms for Peace' plan and Project Plowshare. New Zealand, whose energy needs were met by other sources, soon left the nuclear picture, but Australia's nuclear development led to the installation of two research reactors, and a proposed nuclear power plant on the eastern coast, south of Sydney. In the early 1970s, faced by the uneconomic cost of nuclear electricity, given existing alternatives of coal and hydro-power, Australia declined to embark upon nuclear power, and after much criticized delay, signed and ratified its participation in the Nuclear Non-Proliferation Treaty.[23] During the 1980s, Australia played an important role in the work of the International Atomic Energy Agency in Vienna, and has acted as a regional moderator in discussions of the increasing use of nuclear power in the Asia-Pacific region.

## THE POST-COLONIAL PRESENT

The writing of history necessarily reflects the assumptions of its time. In the twentieth century, Oceania and Australasia have been studied from several different perspectives. The emphasis on discovery, exploration, and colonial encounters

that dominated the literature between 1900 and 1939, has gradually given way to a literature of introspection, comparison, and respect for indigenous 'voices'. With decolonization in the 1960s and 1970s came a newer history, emphasizing regional development and the role of the Pacific in a new internationalism, but within a world still dominated by superpower rivalries (Map 20). A growing interest in cultural unities in the 1980s, has given way in the 1990s to a recognition of the region's many 'separatenesses'. The administrative and linguistic unities imposed from outside masked the consequences of colonial rule for European culture.[24] As the 'master narrative' of colonial rule has fractured, once-easy divisions between pre-colonial, colonial and post-colonial developments are now being set aside in favour of local narratives, in which peoples, places, and cultural identities command greater attention. Historians who once wrote from the standpoint of relations with the imperial powers, now speak of much more complex processes of 'engagement' and self-definition. With this has come recognition that the region's supposed transition from a colonial past to a post-war, post-colonial future has been anything but smooth. Arguably, the present began with the

political coups in Fiji in 1987.[25] Places in the Pacific once thought paradisiacal no longer seemed securely so.

Nothing quite so dramatic as a coup has threatened Australia, but constitutional relations with Britain, traditionally close – and notably so during a long period of Liberal and Coalition party rule between 1945 and 1972 – were frayed in 1975, when the elected government was forced to resign by the representative of the Crown. When Britain entered the European Common Market, both Australia and New Zealand were obliged to review their economic and political positions, which has had far-reaching consequences for public and institutional practices. While educational, family and trade links remain strong, loyalties to the monarchy have much attenuated within the last decade; and many now find it ironic that the Queen of England should be Australia's Head of State. There is talk that Australia will eventually proclaim itself a republic, albeit one within the Commonwealth. Whatever the case, successive Australian governments have stressed continuity in their role in the Western alliance. After the war, Australia's defence policy – which had always relied upon the participation of its 'great and powerful friends' – turned increasingly towards cooperative agreements with the

*Map* 20 **Decolonization in Oceania**
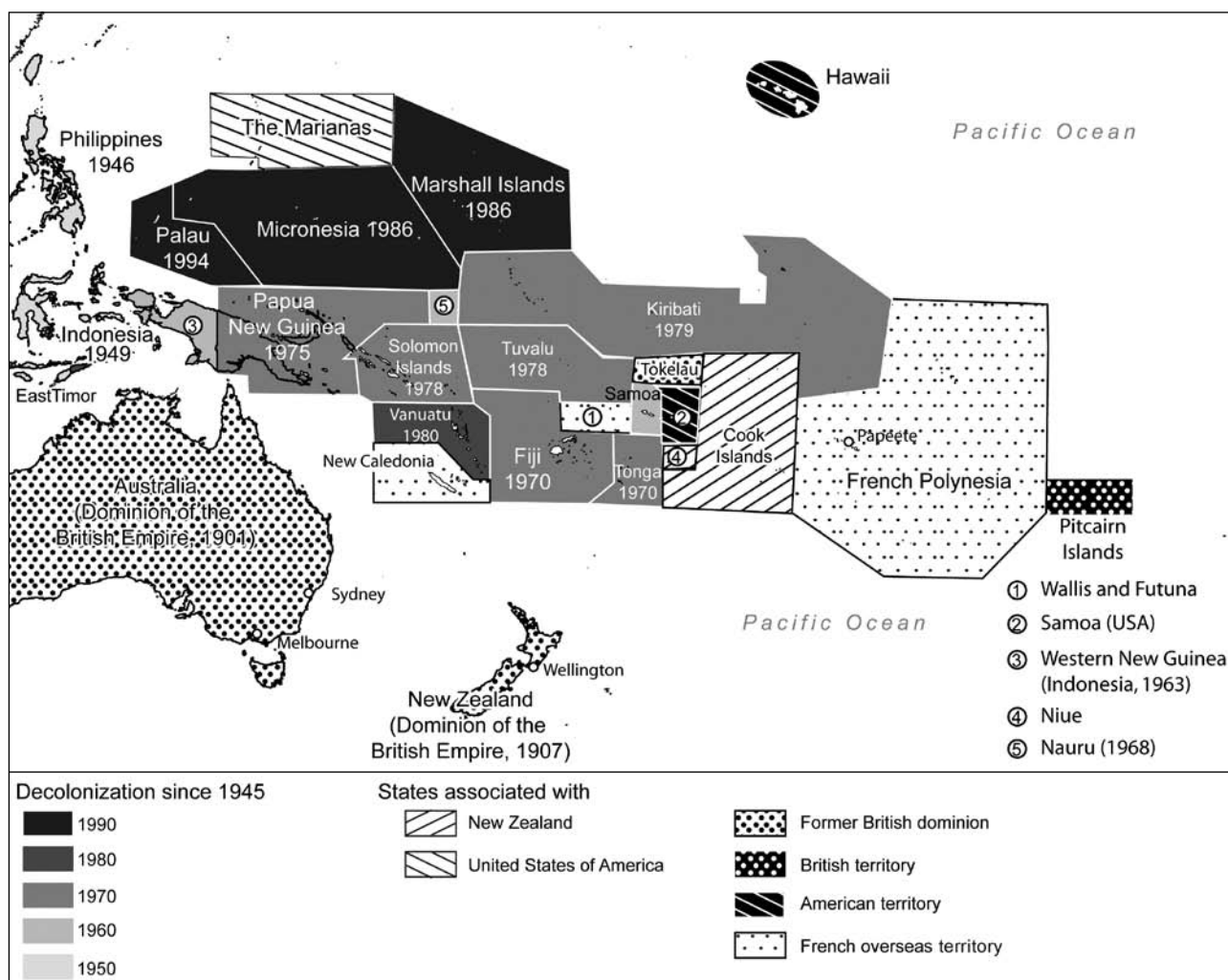


Adapted from J-L Dufour, 2000, *Les décolonisations de 1945 à nos jours*, Armand Colin, Paris.

United States. These were first codified in the ANZUS Treaty in 1951, and later exemplified by its presence in the conflicts in Korea, Viet Nam (Australia was the only country to side militarily with the US in that conflict), and the Gulf War. While New Zealand has shown fewer signs of incipient republicanism, it has asserted a powerful sense of national self-reliance, reflected in a series of austere economic policies, and in its rejection of American nuclear ship visits. Both Australia and New Zealand, along with most of Oceania, have taken up outspoken positions against the continuation of French nuclear tests – the last series of which, in 1995, served to remind inhabitants that the region still remains a laboratory for Europe.

During the last twenty years, both Australian and New Zealand governments have taken major steps to redress centuries of mistreatment and neglect of their indigenous peoples. In 1967, Australian Aborigines, who comprise about 1.5 per cent of the Australian population, were at last invited to share in the symbols and privileges of citizenship; and through the 1980s, increasing (but, so far, inadequate) attention was paid to persisting and difficult problems of Aboriginal health and welfare.[26] In 1992, an historic decision of the High Court of Australia opened the way for the determination of native title in land rights, and negotiations since promise new possibilities for compensation, although not without a legal struggle. Earlier, nation-wide preparations for the bicentennial of European settlement (or 'invasion', as some prefer) in 1988 drew attention to changing cultural identities in Australia, and the importance of Australia's role in the Asia-Pacific region. As Japan and the Republic of Korea emerged as major trading partners, so both countries reviewed their economic, diplomatic and defence links with the United States and Britain. Within the last ten years, what it means to be 'Australian' in an increasingly multicultural society has been a recurrent topic of historical and popular debate. Emerging self-definitions have encouraged a new tolerance and respect for women and minorities. In New Zealand, where British traditions have been perhaps slower to fade, biculturalism has progressed beyond mere lip service to treaty obligations, and is now enshrined in the educational and cultural life of the country. It is expected that *pakehas* (i.e. persons of European descent) will be taught Maori in primary school.

Today, the many different peoples of Oceania seem united only in wishing for political identity and economic independence, and are deeply divided on the ways and means of achieving either. If a complex colonial history underscores the region's past, so it frames its present. Europe (notably France) continues to express an interest in its future, as does the United States, but it is likely that Japan, which helped initiate the concept of a Pacific Basin community, will play an increasingly dominant role in its management. But in many islands, neither political nor educational systems, nor communal relations, nor concepts of ownership exist which Western science-based enterprises could be built upon; even while much effort is devoted to attempts to diversify the economic base by improving agriculture and mineral resources for export to other countries on the Pacific Rim.

The scientific and economic future of Oceania depends to a considerable extent upon the settlement of unresolved political tensions, which in turn reflect the different traditions of the three large cultural groups and their many ethnic divisions. In 1947, by the so-called 'Canberra Agreement', the former Allied governments with colonies in the region established the South Pacific Commission to ensure social and economic stability of what promised then to be a turbulent region. Gradually, between 1960 and the 1980s, the five-country membership of the Commission was enlarged to include 22 of the island nations and territories, in which the Commission, with its headquarters in Noumea, has sought new ways of implementing appropriate technology in agriculture and marine resources, while cultivating community health, rural development, women's programmes, and community education. However, its current budget is only about $22 million, and falls far short of what is needed.

Until 1962, all the islands had some form of colonial or protected status, and used borrowed forms of colonial rule, except for Tonga and Western Samoa, which retained monarchies and aristocratic forms of government. Today, ten of the islands are independent countries,[27] nine are trust territories,[28] while three others form part of the Trust Territory of the Pacific Islands,[29] technically under United Nations Control but actually administered by the United States. Five of the countries are members of the United Nations, and nine are members of the (former British) Commonwealth. New Caledonia, French Polynesia and Wallis and Futuna are seeking political independence. American Samoa, Guam, the Commonwealth of Northern Marianas and Belau have retained their dependency status with the United States, while Niue, the Cook Islands, the Marshalls and the Federated States of Micronesia have entered 'free association' agreements with their former colonial powers (the latter two, with the United States).

All four are members of the South Pacific Forum, set up in 1969 to encourage regional cooperation as an avenue to prosperity and collective influence. This presently includes 14 countries of Oceania plus Australia and New Zealand, and acts as a caucus on regional issues. Perhaps its most noticeable success has been its institutionalized opposition to nuclear testing, the traffic in nuclear weapons, and the dumping of radioactive wastes within the South Pacific Nuclear Free Zone, created by the Treaty of Rarotonga in 1985. The Forum's regional bodies include the Forum Fisheries Agency, the Pacific Forum Line (to provide a reliable shipping service in the region), and the South Pacific Regional Environmental Program (for environmental protection). These have pursued cooperation policies to regulate drag-net fishing, and to study the effects of global warming upon low-lying atolls. Such measures are valuable, but whether they create a climate for the popular understanding of science is at best debatable. Science policies in the region have included many attempts on the part of UNESCO and other agencies. Papua New Guinea has had a government science policy apparatus since 1975. But 'Pacific science' remains a field of study dominated by the nations and scholars of Europe and the Rim;[30] and international recognition that there is also a science 'of the Pacific Island peoples', which can embrace local as well as Western practices, is a much more recent development.[31]

Generalizations are difficult, but all the islands can be considered 'Third World' countries, with wide discrepancies in local wealth, political instability, and threats to civil order. Almost all the islands have, since the 1970s, faced increasing pressures from ethnic and democracy movements. In Vanuatu, there is a volatile peace, in Fiji, a recent history of military coups and ethnic strife, and in Papua New Guinea, a

simmering rebellion. Many Micronesians live in towns, but most Oceania islanders are rural dwellers, whose economy is based upon primary agriculture and marine resources. The per capita GDP of the thirteen islands varies from the relative wealth of Fiji, with $1,182, to Kiribati, with only $271. Inter-island trade is very small, while earnings from traditional plantation commodities (sugar, coffee, copra, etc.) have largely disappeared. Some look favourably upon the experience of Indian Ocean and Caribbean countries, as examples of what small island states can achieve. Others are less optimistic.[32]

The distribution of natural resources varies widely, and while marine resources are relatively abundant in some of the 200-mile Economic Exclusion Zones established in the 1970s – a development that may well have enormous implications for regional development – others have little.[33] In terrestrial resources, Papua New Guinea and Fiji are relatively well endowed, while the atolls of Kiribati and Tuvalu, at the other end of the spectrum, are not. Papua New Guinea boasts three forms of secondary industry – resource processing to convert raw materials (such as coffee, tea, timber, copra and cocoa) into consumer process; small-scale industries, such as motor vehicle repair and soft drink manufacture that are by-products of urban life, and service industries. There has been little opportunity for heavy industry to be built, owned or operated by local entrepreneurs. In 1994, 70 per cent of secondary industry in Papua New Guinea was foreign owned (88 per cent of which was Australian); while the small proportion (c. 10 per cent) of the secondary industry workforce that was expatriate received 50 per cent of industrial wages. It is hoped that the country's huge mineral wealth in Bougainville, when fully exploited, will be processed, with a view to producing 'value added' before export, as well as profitable subsidiary industries. The 'value added' process, which took years to introduce in the far more technologically sophisticated mining industries of Australia, may take more to complete in Papua New Guinea.

The applications of science and technology, once thought as a tool kit of possible solutions to the problems of underdevelopment, seem now far more problematic in their ownership and use. The role of science and technology in economic survival is linked to political change, and to an increased participation in international trade.[34] Island aspirations are high, but infrastructures are unsteady. The restraining effects of small overseas markets are compounded by high imports, producing systemic deficits. For most islands, a recipe for economic survival relies heavily upon fishing, international agreements, overseas aid (a fifth of Australia's aid budget goes to Papua New Guinea), investment (notably from Japan and the European Union), and tourism. In the immediate future, tourism more than trade – and both more visibly than scientific research or development – are likely to define the political economy and culture of the smaller islands, while in the larger, the interests of multinational mining companies, often involving high capital-intensive technologies, have become, and will probably remain, sources both of wealth and political resentment. Emigration to North America, Australia, or other wealthier climes – there are three times as many Niueans who live in New Zealand as in Niue – has had an important impact, in which it is difficult to weigh the value of remitted earnings against the loss of talent.[35]

In this context, Western science has brought important changes, but few revolutions. In a region almost entirely post-colonial, science and technology play an essential part in everyday life, but the systems are paid for and built by external aid and expertise. The conservation of wildlife and resources, the recognition of communal ownership, and the careful monitoring of 'eco-tourism' all require concerted efforts among the islands and their regional agencies, lest they disadvantage the environment and its inhabitants. Advanced technologies of communication and transportation have replaced traditional forms, but Western and Japanese investment and commercial fishing practices threaten, as well as benefit, the interests of local populations. If there is one area where there is growing solidarity, it is against the use of the Pacific as a testing ground. For many years, islands that formed part of British and American nuclear and missile testing facilities drew economic benefit from that connection. Now that nuclear testing has ended, islands held under special agreements by the great Powers, including the Phoenix group, will be obliged to seek other solutions. For one – Johnston Island – a solution is clear, as it remains one of America's six depositories of chemical weapons, and forms part of current plans to incinerate such weapons from the American arsenal. For the region in general, given that traditional agricultural export prices continue to fall, experts recommend more attention to private sector enterprise – inevitably linked, as always, to international expertise and overseas investment.

The 'plight' of the Pacific and its islands lies in profound contrast to the prosperity of Australia and Aotearoa/New Zealand. Today, Australia (pop. 17 million) and New Zealand (pop. 5 million) are the Pacific's regional powers, and are world leaders in the arts, sciences, and literature. Both have extensive relations with their Oceanic neighbours, as with Asia, the Americas and Europe, and both are drawn increasingly together in economic and defence cooperation. In Australia and New Zealand, the techno-scientific infrastructure is resilient, but its support is the subject of recurrent debate. Australia has over 600,000 students in higher education, and spends annually 1.6 per cent of its GNP (1992–93) on research and development. Its scientists contribute about 2.1 per cent of the world's scientific literature, above the country's proportional research spending. Australian research spending in 1992 was the second-highest rate level of involvement with the public sector. Within the OECD, Australia's ratio of scientists and engineers to its labour force is 50 – above the median of 45, and higher than that of other Asia-Pacific countries, although far below Japan (75) and the United States (76).[36]

Science is no longer 'colonial' in either country, although both are 'interdependent' on the dominant economies, particularly the USA and the European Union, for much of their collaborative effort. Recent efforts to focus resources on a smaller selection of fields in which they can 'compete' have led to considerable debate in both concerning 'concentration' vs. 'balance' in research and infrastructure. In both cases, there has also been considerable effort – in Australia, by modifications within the research-intensive CSIRO, and in New Zealand, in the dismemberment of DSIR – to link basic research to industrial goals and social and economic outcomes. New Zealand has restructured its science agencies into ten Crown Research Institutes (CRIs), to produce knowledge of relevance to industry, but also to ensure that Maori interests are served. Today, there appear to be no Maori scientists, using Western definitions, and projects proposed by Maoris to the Public Good Science Fund are few, but as CRI scientists and Maoris engage with

one another, there is potential for new models of associating science and technology with the expressed interests of indigenous peoples.[37]

Given the sheer diversity of the region, Western scientific culture has been unevenly experienced. For the same reason, the educational impact of science is difficult to measure. The University of the South Pacific, established in 1968, has several regional campuses in which science is taught; and the francophone Pacific is strengthening provision for science in higher education in French Polynesia and New Caledonia. In Oceania, it is clear that science and technology, while holding much potential for marine development, have not been the salvation of the islands; on the contrary, in some ways, as elsewhere in the world where modern science has confronted indigenous systems, technology transfers have had the usual two-edged effect of creating employment and expanding horizons, while threatening traditional values and established cultures. Basic facilities are limited. For example, Tonga spends 13 per cent of its national budget on health, but with a population of fewer than 100,000 people, this represents only $28 per person, which has to cover health education as well as medical care. It is not surprising that Tongans still debate AIDS more as a question of morality than as a disease.[38]

Researchers repeatedly demand public health measures to counter water-borne diseases that are by now unfamiliar in the West.[39] Nutritional shortages linked to the consumption of processed foods are contributing to 'diseases of affluence, without the affluence'.[40] Global environmental problems are endangering the coral reefs and islands, threatening the health of local populations historically dependent on sea food, and causing concern throughout the world.[41] Claims and counter-claims cloud the environmental consequences of the French nuclear tests since 1966 on the Taumotu atoll of Mururoa, 1,250 km south-southeast of Tahiti, but it is clear that the matter is affecting not only international public opinion, and island nationalism, but also the tourist trade from which France (and Polynesia) had hoped so much.[42]

Meanwhile, from American Samoa, come reports of a boom in personal computers, producing new possibilities for networking and exchange of ideas. As deep-sea mining becomes more economical, the oceans may offer new opportunities for technology, but the extent to which islanders will reap the profits of such activity remains to be seen. Meanwhile, the phosphate industry on Nauru, and the ecology of Nauru itself, is nearly exhausted, while the environmental consequences of high-tech mining in Bougainville are hotly contested. The means of achieving sustainable development is high on the agenda of the South Pacific Forum, and of United Nations agencies with missions in the region. But there is little mention of Oceania in the planning documents of APEC, which focuses more upon Australia's participating in the expanding Asia-Pacific market. Current policies towards Oceania risk becoming nothing more than another phase in the developmental colonialism that has characterized the history of the region.[43]

## RETROSPECT AND PROSPECT

'Oceania' and the 'Pacific' are names given by Europeans to a region that Europeans first invented, later colonized, and still effectively control. Through three phases of Western influence – 200 years of Spain, 150 years of Britain and France, and 50 of the United States – its vast spaces are invested with meanings that others have imparted to it, but whose complexities are still largely unrecognized outside the region.[44] There is no dearth of Pacific scholarship. On the contrary, there are at least twelve major English-language journals devoted to Pacific questions in the fields of politics, economics, geography, anthropology and science; and many others – edited in Russia, France, Germany, the Republic of Korea and Japan – publish studies of the region.[45] From the diversities of the region, Europeans have collected and codified metropolitan 'museum cultures' of languages, art, artefacts, and natural products. Its islands and seas have served as quarry, plantation, farm, and site of rival religions and cultural 'civilizing missions'. Despite protests, it remains a laboratory space in which two countries used to explode nuclear devices, and a third still does, and where, until recently, three countries tested missiles. Its history has seen four centuries of Western science and culture, and a history of acceptance, assimilation, modification and rejection. But while science may help us understand the region, it is less certain to change it.

That change may, or must, come from the indigenous peoples themselves. From traditional cultures and languages 'outsiders' and settlers have still much to learn. Now, as in the eighteenth century, Western 'experts' may return home better informed about tropical agriculture and marine life from talking with Melanesian farmers and Micronesian fishermen, than from their science-based university seminars.[46] Domains of natural knowledge previously dismissed as merely 'ethnoscience' are beginning to receive belated recognition.[47] Increasingly, attention to traditional, 'holistic', farming and fishing practices – whether as an antidote to modern life, or in accommodation with modern techniques – has suggested ways of improving the health and nutrition of islanders who are otherwise impaired by Western diets. Finance to enable the individual or community development of successful traditional practices, rather than their mere replacement by technologies transferred from elsewhere, may give an impetus to local innovation.[48] The contribution that such practices may make to 'sustainable development', now widely canvassed by the United States, as well as regional conferences, must hold part of the answer for the post-colonial Pacific.[49]

In an age of declining aid budgets, regional assistance is uneven. Few, if any, Australian universities are conducting research on 'alternative' technologies that may be used in island development, or into the Western scientific basis of alternative medical strategies as used in the islands. By contrast, most large, publicly funded Australian museums now have Aboriginal curators and educators, and the proposed National Museum of Australia in Canberra will give Aboriginal histories, oral traditions and ways of knowing a central place among its three component spaces. In New Zealand, the new National Museum now under construction in Wellington is to be centred around Maori history and the experience of biculturalism. As such, whether it will complement concepts in Maori, or Maori science, remains to be seen.

All such developments are contested, and many remain problematic. From South Africa to India, the experience of 'Third World' countries has shown that high tech and traditional methods can usefully coexist. Primary and

secondary education in such countries can usefully learn from the history of local, rather than foreign, ways of transmitting scientific ideas – out-of-school knowledge can be privileged, instead of resisted, while local languages can be employed to assist the communication of concepts describing natural objects and processes.[50] From the mixed legacies of the West, the peoples of Oceania have contrived 'evolving amalgams', new indigenous cultures, which absorb the power of science and technology, while challenging its dominance in every walk of life.[51] Direct satellite access to television for science and cultural education is a present and expanding reality throughout the region; it remains to be seen what uses are made of it, and what philosophy will govern its regional programming. Meanwhile, from island societies where young people are taught knowledge of nature along with a respect for ecological practices, there is much the West can learn.[52] An understanding of science and its practices as an ethical system – as well as a model of the world, and a search for objective, reproducible knowledge following discoverable universal laws – may be among the greatest, if so far unrealized, benefits of this engagement.

At the turn of the millennium, Australia and New Zealand are small, highly developed cosmopolitan societies, securing access to the expanding markets of Asia while sustaining ties of culture and community with the Americas and Europe. At the same time, both envisage a role – what a recent Australian foreign minister, Gareth Evans, called 'constructive commitment' – in Oceania, a region that remains otherwise burdened with the legacies of underdevelopment, political and ethnic unrest, poor literacy, and economic dependence.[53] No one believes that remedies are easy.[54] Some argue that the islands should be spared further Western intrusion; others seek workable adaptations. Increasingly, the recognition and apportionment of intellectual property rights in so-called 'closed' traditional knowledge systems and techniques is becoming an important issue in international law, with potential consequences for island cultures and economies. Elsewhere, significant structural readjustments that might lead to a fast-growing export base, linked to the 'new Asia', are possible, but history suggests how difficult they will be to achieve.[55] The region has been cast bravely into the script of the new 'Pacific Century', but for the foreseeable future, it seems questionable whether Oceania – or Australasia – will be more than a minor actor in the great spectacle that will take place in a region dominated by the economic superpowers, and the giants of North Asia.

## NOTES

1.   For an overview of the region, see T. U. Fairbaim et al., *The Pacific Islands: Politics, Economics and International Relations*, Honolulu, 1991

2.   D. Oliver, *Oceania: The Native Cultures of Australia and the Pacific*, Honolulu, 1989, Vols. 1 and 2.

3.   The term 'Oceania' normally excludes the non-tropical Ryukyn and Aleutian islands and the Japanese archipelago, and also excludes Indonesia, the Philippines and Formosa, which are regarded as more closely related to the Asian mainland, and Norfolk Island, which is a territory of Australia. Australasia was once taken to include New Zealand (and will be in this chapter), although this usage is not now politically correct, while of course Tasmania is a state of Australia.

4.   For regional information, see A. Bescher (ed.), *The Pacific Rim Almanac*, New York, 1991; S. Hoadley (ed.), *The South Pacific Foreign Affairs Handbook*, Sydney, 1992; *The World Factbook*, Washington DC, 1993; and the *Macquarie World Atlas*, Canberra, 1994.

5.   Useful introductions to the literature include O. H. K. Spate, 'South Sea to Pacific Ocean: A Note on Nomenclature', *Journal of Pacific History*, Vol. 12, No. 3–4, 1977, pp. 205–11; *The Spanish Lake: The Pacific since Magellan*, Vol. 1, Canberra, 1979; and B. W. Smith, *European Vision and the South Pacific, 1768–1850: A Study in the History of Art and Ideas*, Oxford, 1960, New Haven, 1985.

6.   See N. Thomas, 'Licensed Curiosity: Cook's Pacific Voyages', in: J. Elsner and R. Cardinal (eds), *The Cultures of Collecting*, Melbourne, 1994, pp. 116–36; R. MacLeod and P. F. Rehbock (eds), *Darwin's Laboratory: Evolutionary Theory and Natural History in the Pacific*, Honolulu, 1994.

7.   A. Moorehad, *The Fatal Impact*, London, 1966.

8.   For the extensive literature on Island history in English, it is useful to begin with D. Scarr, including *The History of the Pacific Islands: Kingdoms of the Reefs*, Melbourne, 1990; *Fragments of Empire: A History of the Western Pacific High Commission, 1877–1914*, Canberra, 1967; (with J. W. Davidson), *Pacific Island Portraits*, Canberra, 1970; and *More Pacific Islands Portraits*, Canberra, 1979.

9.   Readers unfamiliar with Australian history could profitably begin with R. White, *Inventing Australia: Images and Identity, 1688–1980*, Sydney, 1981, and continue with the popular, if polemical, R. Hughes, *The Fatal Shore*, New York, 1987.

10.   For introductions to the literature, see R. MacLeod and P. F. Rehbock (eds), *Nature in its Greatest Extent: Themes in the History of Western Science in the Pacific*, Honolulu, 1988; C. Finney, *Paradise, Revealed: Natural History in Nineteenth-century Australia*, Melbourne, 1993.

11.   S. Sheets-Pyenson, *Cathedrals of Science: The Development of Colonial Natural History Museums during the Late Nineteenth Century*, Kingston and Montreal, 1988; R. Bhathal and G. White, *Under the Southern Cross: A Brief History of Astronomy in Australia*, Kenthurst, NSW, 1994.

12.   R. MacLeod and P. F. Rehbock (eds), *Darwin's Laboratory: Evolutionary Theory and Natural History in the Pacific*, Honolulu, 1994.

13.   Cf. D. Wade Chambers, 'Does Distance Tyrannize Science?', and D. Knight, 'Tyrannies of Distance in British Science', in: R. Home (ed.), *Australian Science in the Making*, Sydney, 1988, pp. 19–39 and 39–54 respectively.

14.   See, for example, E. Dalton Newland, 'Dr George Bennett and Sir Richard Owen: A Case Study of the Colonisation of Early Australian Science', pp. 35–74; and R. Home, 'A Worldwide Scientific Network and Patronage System: Australian and other "Colonial" Fellows of the Royal Society of London', in R. Home (ed.), *Australian Science in the Making*, Sydney, 1988, pp. 151–80.

15.   R. MacLeod (ed.), *University and Community in Nineteenth Century Sydney: Professor John Smith and Science in the Colonial Metropolis, 1821–1885*, 1988.

16.   R. MacLeod, 'On Visiting the "Moving Metropolis": Reflections on the Architecture of Imperial Science', *Historical Records of Australian Science*, Vol. 5, No. 3, 1982, pp. 1–16; reprinted in: N. Reingold and M. Rothenberg (eds), *Scientific Colonialism: A Cross-Cultural Comparison*,

Washington DC, 1987; and the essays in R. Home (ed.), *Australian Science in the Making*, Sydney, 1988.

17. J. Todd, *Colonial Technology: Science and the Transfer of Innovation to Australian*, Melbourne, 1995.

18. R. MacLeod (ed.), *The Commonwealth of Science: ANZAAS and the Scientific Enterprise in Australasia, 1888–1988*, Melbourne, 1988.

19. See, for Britain, R. MacLeod and E. K. Andrews, 'The Origins of the DSIR: Reflections on Ideas and Men 1915–1916', *Public Administration*, Vol. 18, No. 1, 1970, pp. 23–48; for Australia, C. B. Schedvin, *Shaping Science and Industry: A History of Australia's Council for Scientific and Industrial Research, 1926–1949*, Sydney, 1987. A history of New Zealand's DSIR is being written by Dr Ross Galbreath.

20. See S. Firth, 'The War in the Pacific', in D. Denoon (ed.), *The Cambridge History of the Pacific*, Cambridge 1997.

21. S. G. Foster and M. M. Varghese, *The Making of the Australian National University, 1946–1996*, Sydney, 1996.

22. The phrase – which was intended as ironic – was popularized, but not invented, by D. Horne, *The Lucky Country*, Sydney, 1965.

23. R. MacLeod, 'Nuclear Knights vs. Nuclear Nightmares: Experts as Advocates and Emissaries in Australian Nuclear Affairs', in R. Cabral (ed.), *Perspectives on Nuclear History*, Göteborg, 1994, pp. 97–112; 'The Atom Comes to Australia: Reflections on Australian Nuclear History, 1953–1993', *History and Technology*, Vol. 11, No. 3, 1994, pp. 1–17.

24. See K. R. Howe et al., *Tides of History: The Pacific Islands in the Twentieth Century*, Sydney, 1995.

25. Ibid., preface, xii.

26. For an introduction to the history of Aboriginal issues, see H. Reynolds, *The Other Side of the Frontier*, 1981, and *Fate of a Free People*, Sydney, 1995. Earlier work of importance includes C. D. Rowley, *The Destruction of Aboriginal Society*, 1970, B. Reece, *Aborigines and Colonists: Aboriginals in Colonial New South Wales in the 1830s and 1840s*, 1974, and L. Ryal, *The Aboriginal Tasmanians*, 1981.

27. Vanuatu, the Solomon Islands, Fiji, Samoa, Tonga, Tuvalu, Easter Island, Wake Island, Nauru and Kiribati.

28. French Polynesia, New Caledonia, Wallis and Futuna (France); Cook, Niue and Tokelau (New Zealand); Pitcairn (UK) and American Samoa and Guam (USA).

29. The Marshalls, the Carolines and the Marianas.

30. See P. F. Rehbock, 'Organizing Pacific Science: Local and International Origins of the Pacific Science Association', *Pacific Science*, Vol. 45, No. 2, 1991, pp. 107–22.

31. John Morrison et al. (eds), *Science of Pacific Island Peoples*, Suva, 1994–95, 4 vols.

32. See World Bank, *Pacific Island Economies: Toward Effective and Sustainable Growth*, Vol. 1: *Overview*, Washington DC, 1993.

33. F. Rawdon Dalrymple, 'Partners, Friends and Allies: Australia and the Pacific', *Australian Foreign Affairs Record*, Vol. 56, September 1985, p. 820.

34. See the Asia-Pacific Economics Group, *Asia-Pacific Profiles*, Canberra, 1993; *South Pacific Economies: Statistical Summary*, No. 13, 1993, et seq.

35. R. Thakur, 'Introduction', *The South Pacific: Problems, Issues and Prospects*, London, 1991, p. 7.

36. Cf. Bureau of Industry Economics, *Science System: International Benchmarking*, Canberra, 1996; *Australian Science: Performance from Published Papers*, Canberra, 1996.

37. M. Mutu, 'Maori Science and the Crown Research Institutes of Aotearoa/New Zealand', in J. Morrison et al. (eds), *Science of Pacific Island Peoples*, Vol. 4, pp. 151–58.

38. 'The Healers of Tonga', *Pacific Islands Monthly*, Vol. 59, No. 17, June 1989, p. 18; 'AIDS Campaign Fights Taboos', *Pacific Islands Monthly*, Vol. 59, February 1989, p. 10.

39. Cf. U. K. Prasad, 'Research Needs for Improving the Health of Micronesian Children', *Isla: A Journal of Micronesian Studies*, Vol. 1, No. 2, 1992, pp. 251–60.

40. P. Schoeffel, 'Food, Health and Development in the Pacific Islands: Policy Implications for Micronesia', *Isla: A Journal of Micronesian Studies*, Vol. 1, No. 2, 1992, pp. 223–50.

41. There is a large popular and technical literature on the subject. See for example, D. Robie, 'Paradise in Peril', *Pacific Islands Monthly*, Vol. 60, No. 7, July 1990, pp. 8–13; G. B. K. Baines and R. J. Morrison, 'Marine Pollution from Landuse in the Pacific Islands Region', *Marine Pollution Bulletin*, Vol. 21, No. 11, 1990, pp. 506–15; R. W. Grigg, 'Coral Reefs and Environmental Changes – The Next 100 Years: A Synopsis and Abstracts of Papers Presented at a Symposium of the XVII Pacific Science Congress', *Pacific Science*, Vol. 46, No. 3, 1992, pp. 374–82.

42. J. Galtung, 'The Pacific: A Poisoned Nuclear Lake', *The Contemporary Pacific*, Vol. 1, Nos. 1–2, 1989, pp. 174–80, reviewing B. Danielson and M. T. Danielson, *Poisoned Reign: French Nuclear Colonialism in the Pacific*, Ringwood, 1986; and P. Hayes et al., *American Lake: Nuclear Peril in the Pacific*, Ringwood, 1987; and S. Firth, *Nuclear Playground*, Sydney, 1987. For closely observed accounts of the Pacific's nuclear history since Nagasaki, see S. Firth and K. von Strokirch, 'A Nuclear Pacific', Chapter 10, in D. Denoon (ed.), *Cambridge History of the Pacific*, forthcoming.

43. Cf. S. Henningham, 'The Region in Review: International Issues and Events, 1993', *The Contemporary Pacific*, Vol. 6, No. 2, 1994, pp. 30–37.

44. See R. Crocombe, 'Pacific Science in the 21st Century', in J. Morrison et al. (eds), *Science of Pacific Island Peoples*, Vol. 4, pp. 41–53.

45. A selection of journals (and dates of foundation) includes: *Oceania* (1930), *Pacific Islands Monthly* (1930), *Pacific Science* (1947), *Pacific Viewpoint* (1960), *Archaeology and Physical Anthropology in Oceania* (1966), *The Journal of Pacific History* (1967), *Pacific Research* (1969), *Pacific Studies* (1977), *Pacific Report* (1985), *Pacific News Bulletin* (1986), *Pacific News from Manoa* (1991), and *Isla: Journal of Micronesian Studies* (1992). Among the most recent is *The Contemporary Pacific: A Journal of Island Affairs*, published by the Centre for Pacific Island Studies at the University of Hawaii (1989).

46. Crocombe, op. cit., p. 47.

47. See, e.g. R. R. Thaman, 'Ethnobotany of Pacific Island Coastal Plants', in J. Morrison et al. (eds), *Science of Pacific Island Peoples*, Vol. 3, pp. 147–48; and A. Walter, 'Knowledge for Survival: Traditional Tree Farming in Vanuatu', in J. Morrison et. al., op. cit., pp. 189–200.

48. N. Petaia, 'Incorporating Traditional Knowledge in Development Activities: Western Samoa', in J. Morrison et al. (eds.), *Science of Pacific Island Peoples*, Vol. 4, pp. 173–89.

49. Cf. United Nations, World Commission on Environment and Development, *Our Common Future*, New York, 1987, discussed in W. C. Clarke, 'Learning from the Pacific: Traditional Knowledge and Sustainable Development', *The Contemporary Pacific*, Vol. 2, No. 2, 1990, pp. 233–53.

50.    See, for example, E. W. Batiri Williams, 'The Roles of Information and Communication in Development', in: J. Morrison et al. (eds), *Science of Pacific Island Peoples*, Vol. 4, pp. 217–30.

51.    Crocombe, op. cit., p. 52.

52.    W. Pond, 'Parameters of Oceanic Science', in J. Morrison et al. (eds), *Science of Pacific Island Peoples*, Vol. 3, p. 117.

53.    T. Marjoram, 'Technology and Development in the Small Island States of the South Pacific', in *Technology for Rural Development* 2nd *Asian Conference*, December 1985, Singapore, 1988, pp. 44–72; E. Bettrametti (ed.), *Local Cultures and Transfer of Technologies International Centre of Culture for the Development of Peoples*, Genoa, 1987.

54.    Cf. H. Brookfield, 'Global Change and the Pacific: Problems for the Coming Half-Century', *The Contemporary Pacific*, Vol. 1, Nos. 1–2, 1989, pp. 1–17; R. G. Ward, 'South Pacific Island Futures: Paradise, Prosperity, or Pauperism', *The Contemporary Pacific*, Vol. 5, No. 1, 1993, pp. 1–21.

55.    For the region, see G. Segal, *Rethinking the Pacific*, Oxford, 1990; for the islands, see R. Callick, 'Pacific 2010: A Doomsday Scenario?', in R. Cole (ed.), *Pacific 2010: Challenging the Future*, Canberra, 1993; and R. Cole and S. Tambunlertchai (eds), *The Future of the Asia-Pacific Economies: Pacific Islands at the Crossroads*, Canberra, 1993.

# D

## CONCLUSION

# 39

## AN INTERDEPENDENT WORLD: ACHIEVING PEACE AND SUSTAINABLE DEVELOPMENT THROUGH INTERNATIONAL COOPERATION

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The twentieth century has left the present century a legacy fraught with consequences and concern for the future. The processes of interdependence and globalization were initiated and advanced in all fields of activity; no continent was left untouched, but flagrant inequalities persisted. The century's unprecedented scientific and technological progress affected the everyday lives of people in those countries that had access to such advances.

The example of speed itself is particularly striking. Before the Second World War, express trains travelled at an average speed of 100 to 150 kms per hour. By the end of the century, they were able to attain record speeds of over 250 kms per hour. Although ocean liners hardly increased their average speed beyond 29 to 30 knots, hydrofoils and hovercraft reached speeds of 65 knots, or 110 km per hour. The development of aviation was closely linked to its military applications: after being used in a limited manner in 1914, aviation became decisive in the period from 1939 to 1945. Helicopters could travel no faster than 650 kms per hour, the speed at which the relative velocity at the tips of their propellers approaches the speed of sound. However, jet planes, both military and civilian, largely exceeded that limit: by 1976 the supersonic jet attained a cruising speed of over 2,000 kms per hour. The main obstacle to further progress was the high level of investment and maintenance costs. At the end of the twentieth century, it seemed that while space flights would be able to achieve still greater speeds, this was no longer the case with land, sea or air transport.

Information technology is evolving at an ever-increasing pace. Computers are getting smaller while their capacity is increasing. The Internet now provides all sorts of information in a split second. In industry, robots programmed to carry out essential production processes more quickly are gradually replacing unskilled workers and easing the workload of others.

There has been opposition to the use of industrial robots and office technology in some quarters, but it is clearly no more than a rearguard action in the industrialized countries, where the most it can achieve is assist in transition processes and in the preparation of new employment policies. Another aspect of technology's impact on everyday life was the key role of architects and civil engineers in the construction of bridges and canals and the erection of towering office and apartment blocks.

The revolution in information technology is one of the most remarkable achievements of the twentieth century. It has greatly changed peoples' lifestyles. The widespread use of the technology tremendously facilitates the information flow, business transactions and communication between inhabitants of different countries and continents.

Biologists learned how to manipulate life itself. From 1978 onwards, *in vitro* fertilization was commonplace, and living organisms could be created and genetically modified. Although life scientists identified 19,099 genomes in an Earthworm and 25,000 in a garden weed, they were still unable to explain life. Such developments raised more ethical questions than ever before. Meanwhile, life expectancy for both men and women had continually lengthened – but only in the developed countries.

The exchange of knowledge made possible by the mass media, the development of transport and communication, and the work of curators, archaeologists, ethnographers and translators has enriched all of the world's cultures. For the first time, the cultural heritage of the peoples of Asia, Africa and Latin America became part of the cultural heritage developed by Europeans and North Americans. The level of education of the general population improved, and plans to eliminate illiteracy were drawn up. Despite these achievements, by the end of the century, approximately 30 per cent of the adult population of the planet remained unable to read or write.

Decolonization and national liberation, which became widespread from 1960 onwards, have not reduced the gap between rich and poor, and countries receiving aid are having great difficulty in coping with the increasingly large-scale population movements.

Sports and physical education became widespread. The Olympic Games was relaunched in the late nineteenth century, on the initiative of Pierre de Coubertin, enabling the world's different peoples to compete with one another in a spirit of peace, even if efforts to win medals and break records were tinged with nationalism and sometimes tainted by the use of illicit drugs. New sports, such as hang-gliding, windsurfing and ballooning emerged.

The tremendous development of science and technology had far-reaching effects on the lives of individuals and on the social and economic conditions of modern human existence in general. However, further development of the quality of life and standards of living is threatened by recurring conflicts between, and within, nations. This has contributed to widening the gap between rich and poor countries and also constitutes a threat to the ecological environment.

The world continues to exist in a state of turbulence, despite the end of the Cold War. Regional disturbances, ethnic conflicts and civil wars continue to break out throughout the world. Ideologies dominate the world political scene, and conflicts between different nations have been sparked off by historical, linguistic, cultural and religious issues.

The imbalance of the world's economic growth, creating a large divide between rich and poor countries, has left one-fifth of the world's population in abject poverty, deprived of the benefits of modern technological development. This poverty has not only prevented a large proportion of the world population from enjoying a minimum of comfort, but will, if not remedied, have repercussions on the future development of the rich countries as well. Our world will remain utterly divided as long as this discrepancy between the rich and the poor countries continues to exist.

In the competition for the benefits of economic development, entrepreneurs often seek immediate success with large profit margins and pay little or no attention to the protection or the development of the environment or the replenishment of natural resources. As a result, the ecological environment is rapidly deteriorating. The rain forests are shrinking at a surprising rate and arable land is being dangerously encroached upon by desert. Waste gases and the contamination of water, pollution of all sorts and the rise of global temperatures due to over-consumption of energy pose serious threats to the very existence of life on the Earth (not to mention the nuclear threat).

It is our duty to arrest this perilous march towards disaster by making careful use of the advanced scientific and technological knowledge currently at the disposal of the modern world. The advantages accruing to nations with access to the vastly developed resources of science and technology have made them rich and independent. If they can share this wealth with all the other nations, in a spirit of solidarity, the world will certainly be a better place for all.

An important lesson we have learned from the history of the twentieth century is that, however rich and strong these nations have become through the conquest, subjugation and colonization of poorer nations, history will probably mete out justice to them. A spirit of reconciliation and

cooperation should thus become the guiding principle for dealing with conflict situations.

The development of transport, communication and the mass media enables us to obtain more information more quickly than ever before. Yet, even though the same information systems are used throughout the world, each people will react differently according to its own cultural sensibility. It is thus imperative to advocate a tolerant and rational dialogue between all peoples, emphasizing the need to recognize the dignity of all human beings, regardless of sex, race, colour or political affiliations, and to ensure universal respect and protection for human rights.

One of the characteristics of the twentieth century, and more particularly its final decades, was the decline of widespread world views. It has been said, rightly, that the eighteenth century ended with a worldview that 'ordered' and 'rationalized'. Influenced by the Enlightenment and related currents of thought (e.g. the *Encyclopédie* and in particular d'Alembert's 'Discours préliminaire'), the period's world view was optimistic (Condorcet's embryonic notion of 'progress'). The nineteenth century and the beginning of the twentieth generated a new worldview, which also claimed to 'order' and 'rationalize' (e.g. the influence of the philosophical ideas of Auguste Comte in France and Herbert Spencer in England and the political ideas of emergent socialism and liberalism), and was at the same time 'optimistic' (consolidation of theories developed from 'progress' and the more recent theories of 'evolution'). Yet, by the end of the twentieth century, we found ourselves faced with a sort of ideological and axiological upheaval, which, in part, explains the climate of crisis that characterizes the early twenty-first century. We have no desire to reinstate either the Enlightenment or positivism, and we are well aware of their limitations, simplifications and mechanical approach. Suffice it to say that nowadays we lack a comparable worldview and a moderately satisfactory set of values that is acceptable to the majority of the world's population. One need only think of the twentieth-century explosion of irrational, pessimistic thought, authoritarian and fascist political ideas, and scientific trends based, not always legitimately, on principles of doubt and uncertainty. Two world wars and their consequences seem to support the viewpoints of the pessimists. To complete this very schematic overview, we should mention that a serious crisis weakened one of the last worldviews, Marxism, which claimed to 'organize' reality and to be 'optimistic'. Moreover, a certain pretentiousness brought Marxism dangerously close to dogmatism. Religious organizations have also been grievously scathed by the undermining of many of their doctrines and assumptions, as much by criticism based on nineteenth-century evolutionism as by the century's cosmologies, without forgetting the obvious and complex processes of secularization. Many religious groups therefore appear to have adopted a defensive attitude, attempting to reconcile science and religion; the fanatic fundamentalists, on the other hand, have taken the offensive and adopted aggressive and intolerant positions, like obscurantist philosophers always opposed to developments in science and technology and their implications. We should also note the spurious extrapolation of 'chaos' theories to the social and human sciences from physics and mathematics, and 'post-modernism', which has made it even more difficult to get on with the urgent task of reformulating a worldview. In the spirit of UNESCO, we should bolster all pluralist

movements that help to reconstitute a new worldview capable of offering a more structured understanding of reality and gradually helping us to regain a less pessimistic view of the future (or a more optimistic one, essentially based on some key ideas such as science and culture at the service of humanity and society), and to become more rational, since rationality is under attack from various quarters, some of which have been briefly mentioned above.

A related issue is the crisis surrounding the notion of 'universality', mistakenly identified with Eurocentrism, which is one in a series of ethnocentrisms that have developed in all periods and places. Eurocentrism has distorted the image of the world and hindered a proper understanding of it. The phenomenon diminished throughout the twentieth century, particularly since the Second World War and the subsequent process of decolonization. For a long time, great civilizations and cultures of Asia, Africa and Latin America were often condescendingly referred to as 'classical' or 'peoples without history' while others were ignored altogether, but with the waning of Eurocentrism, they could be reintegrated into history, from which they had been marginalized or excluded by the so-called 'West'. We now have to face the challenge of constructing a new kind of universality, which should be more than a broader form of Eurocentrism and more effective. In doing so, we should bear in mind that this new form will not be definitive; indeed it will always be incomplete and subject to new influences. Perhaps this idea of universality, which is consistent with the spirit of UNESCO, will help to reconstitute the deteriorating world view. The search for such a new world view should take into account the need for dialogue among cultures and the recognition of the equal dignity of human beings. To quote the illustrious Mexican novelist Carlos Fuentes: 'When we exclude, we betray and impoverish ourselves. When we include, we are enriched and find ourselves'. The search for ancient roots and processes shows us that identity is many-faceted and constantly evolving and not written in stone.

Furthermore, it should be stressed that culture is not just past or present; since it embraces creation and promise, it is also future. Culture should encompass science and technology and should dismiss communication media, which are dangerously straying from the cultural values societies have adopted and have even created their own counter values in certain cases. A number of experts, such as Swedish sociologist Peter Berger, believe that culture is essentially an attempt to make sense of the world around us, which is essential in light of the turmoil and crises of the contemporary world.

On the subject of urbanization and industrialization, it is worth pointing out that in the great majority of developing countries, urbanization was, and remains, out of step with industrialization. This phenomenon, as complex as it is spectacular, has brought poverty (and destitution) to the cities, and, until the late twentieth century, poverty had been largely a rural phenomenon. Unlike the first period of industrialization in developed countries and regions, the current phase, arising from the new scientific and technological revolution, is not generating employment. Urban poverty has returned and appears in two different forms according to the areas concerned (developed or developing). However, the end result is the same in both cases: a rise in unemployment and poverty in the cities and,

as its direct and immediate consequence, a decline in the quality of urban life (deteriorating services, environmental pollution, dilapidation of housing and the urban landscape, rising delinquency and drug addiction, etc.). Increased marginality and large-scale unmanageable population movements have revealed new challenges for the labour market (concerning the shortage of qualifications for the constantly evolving working environment) and for culture (integrating into a new environment without losing one's identity, in terms of customs, traditions, values, and so on). These factors can partly explain manifestations of xenophobia and racism.

A world based on cooperation, human rights and preservation of world peace calls for important measures including the adoption of a broader concept of culture. We believe that rather than engaging in the usual sterile discussions on what constitutes popular culture or national culture, it is far more important to give the concept of culture itself some substance. This entails stripping the concept of any restrictions and concentrating on its *integrating function*, an aspect increasingly important in a society threatened by problems of alienation and rootlessness and the resulting loss of collective memory. French sociologist Alain Touraine insists precisely on the role of memory in protecting us from biased and misleading information, which is habitually used to give us a distorted view of reality.

We must also underline the limitations imposed on the knowledge of historical processes by narrow or minority views (e.g. history focusing on men to the detriment of women and Eurocentric history). At the very least, we should aim to make a contribution to history so as to give it the 'identity' sought by French historian Fernand Braudel (1902–1985), which includes all the forgotten protagonists: indigenous peoples, workers, slaves, peasants, social outcasts, not to mention all those regions and countries previously neglected. This will call for new categories of analysis. If this requires any justification, one could cite the concepts of time, space and causality, which are now indispensable for a proper understanding of contemporary society. Moreover, science and technology should play a key role in devising these new categories.

In addition, we should comment on the use and transformation of some key ideas, such as those concerning 'progress' and their association with the past and 'development'. The latter notion, as is well known, evolved rapidly from its initial economic connotation to its current meaning related to human development, or just plain development, pluri-dimensional and dynamic. The ideas of 'change' and 'growth', although less often used, should not be overlooked either.

It is also extremely important to note that education systems face two major challenges in addition to their traditional objectives, the most important of which is to form 'individuals' and not just 'producers', consumers, citizens or spectators. One challenge is the 'explosion of knowledge', and the other results from the increasing (and increasingly diverse) demands society places on education systems.

As far as we know, Earth is the only planet in the universe sustaining a complete living system, and we bear a collective responsibility for protecting it. Our resources are not inexhaustible, and the population explosion places an increasing burden on them. We must control the increase

of the world's population effectively while carefully and efficiently using our resources. The reaction of the biosphere to humanity's abuse is global, despite the origin of the abuse. Development should no longer be pursued at the expense of the environment. The latest findings concerning environmental protection should be applied in a framework of effective international cooperation to resolve various problems currently affecting our land, air and water, in order, for example, to protect the ozone layer, counteract the greenhouse effect, stop soil degradation and desertification, promote biodiversity, decrease vulnerability to natural disasters and reduce the damage they cause. These goals were set by the Kyoto Conference (1997), but the application of the resulting protocol by the states responsible for the largest carbon dioxide emissions still leaves much to be desired.

The conference on sustainable development held in Rio de Janeiro in 1992 (the United Nations Conference on Environment and Development) was attended by the representatives of some 180 countries, who discussed the programme for the twenty-first century proposed by the former Norwegian prime minister, Gro Harlem Brundtland. The conference adopted a declaration on issues concerning the environment and development and various important decisions related to the protection of the environment.

True to the spirit of its founding concept of a culture of peace, UNESCO has never ceased its work for the preservation of peace throughout the world. This mandate was reaffirmed at the international congress on Peace in the Minds of Men held in Côte d'Ivoire in 1989. The concept of a culture of peace was introduced into UNESCO's programme by its General Conference in 1994.

In certain respects, globalization goes hand in hand with interdependence, but because it tends to reduce everything, including cultural values, to a marketable commodity and to disregard social aspects, many intellectual and artistic communities and labour unions have taken position against it. Anti-globalization demonstrations, often violent, have converged on meetings of heads of state, but as the process of globalization seems unstoppable, attention is turning instead to the different ways of managing it.

The greatest challenges now facing humanity involve the numerous threats to its security resulting from international terrorism, the proliferation of weapons of mass destruction, financial crises, and epidemic diseases, such as HIV/AIDS, SARS, Ebola, avian influenza and mad cow. International terrorism seriously threatens people's right to a peaceful life, and the United Nations Security Council has passed several resolutions to combat this scourge. To deal with these threats, closer and more effective cooperation within the international community is extremely necessary, and in this context, the United Nations has a pivotal role to play.

It is disturbing that at the end of the twentieth century – and into the twenty-first – the authority of the United Nations has been undeniably undermined, particularly as regards Article 53 of its charter: 'no enforcement action shall be taken under regional arrangements or by regional agencies without the authorization of the Security Council'. Whereas, in the Gulf War, military action was undertaken with a mandate from the Security Council, in Kosovo, NATO intervened without such a mandate.

In fact, the United Nations is facing a crisis because people's perception of the law is out of step with existing legal instruments. This crisis would be useful if it led to a reform of the Security Council and clarification of the right of members of the United Nations to take action, whether individually or collectively. The institution of a permanent International Criminal Court, created in 1998, to judge war crimes is an important step in the right direction, yet more widespread ratification is required.

Nevertheless, the United Nations system is the linchpin of the legacy passed on to the twenty-first century by the twentieth. Its survival, with the adjustments made necessary by the course of events and changes in attitudes, is essential to stability and development in an increasingly interdependent world.

To meet the challenges the world is now facing, the United Nations needs reform. But the purpose of reform must be to strengthen the organization rather than weaken it, so that it is able to continue to play an essential role in the stability and development of an increasingly interdependent world.

# CHRONOLOGICAL TABLE

| SUB-SAHARAN AFRICA | EUROPE | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA |
|---|---|---|---|
| | | 1898 The Fashoda incident. | |
| 1900 First Pan-African Conference, London. | 1900 Sigmund Freud, the father of psychoanalysis, publishes *The Interpretation of Dreams*. Death of Oscar Wilde. | 1900 Mustafa Kamel founds the *al-Liwaa'* daily newspaper in Egypt. | |
| | 1900 Universal Exhibition in Paris. | 1900 Inauguration of the Egyptian Museum in Cairo. | |
| | 1900 Quantum theory proposed by Max Planck. | | |
| | 1900 David Hilbert identifies 23 unsolved mathematical problems. | | |
| | 1901 First ceremony of the Nobel Prizes in Stockholm. | 1901 Iran grants oil concessions to foreign companies. | 1901 The Philippines become US territory following the Philippine-American War. |
| | 1901 Marconi's successful transatlantic communications. | | 1901 Habibullah succeeds his father, Amir Abdul Rahman Khan, to the Afghan throne. |
| | 1901 *Three Sisters*, by Anton Chekhov. | | 1901 Creation of the Commonwealth of Australia. |
| | | | 1901 The Dutch adopt the 'Ethical Policy' in Indonesia. |
| 1902 Establishment of the Academy of Madagascar by the French Government. | | | 1902 The Franchise Act guarantees Australian women (excluding women of non-European ethnic groups) the right to vote in federal elections. |
| 1902 End of Anglo-Boer War in South Africa. | | | |
| 1902 Portuguese colonial government establishes its administrative apparatus in Mozambique. | | | |
| | 1903 The Deutsches Museum devoted to science and technology established in Munich. | | |
| 1904 Construction of the railway linking Benguela and Huambo, Angola. | 1904 The Anglo-French 'Entente Cordiale'. | 1904 Beginning of a wave of Israeli immigration to Palestine. | |
| | 1904 Russian physiologist Pavlov is awarded the Nobel Prize. | | |
| | 1904 Belgian Paul Otlet publishes the Universal Decimal Classification system. | | |
| | 1904 British engineer John Fleming invents the Fleming diode. | | |
| 1905 Portugal completes its military conquests of Angola by crushing the Nkumbi. | 1905 Alfred Binet and Théodore Simon design the first standardized intelligence test. | 1905 Nationalist uprising against the Shah of Iran. | 1905 The Kangra-Dharamshala earthquake in India. |
| 1905 The Cunene Ovambos in southern Angola are subjugated by the Portuguese. | 1905 Albert Einstein published papers on the special theory of relativity. | | |
| | 1905 Development of Fauvism by French painters Matisse, Derain and Signac. | | |
| 1906 Construction of the Great Mosque of Djenné (Mali) begins. | | 1906 Control of Morocco is granted to France and Spain. | 1906 Australia takes control of Papua New Guinea. |
| 1907 Ethiopian ruler Manelik embraces Western agricultural science. | 1907 Radiotelephony developed. | 1907 Creation of the Umma Party and its daily paper *al-Jarida* in Egypt. | 1907 A college of engineering and technology founded at Jadavpur, India. |
| | 1907 *Les Demoiselles d'Avignon*, by Spanish artist Pablo Picasso. | 1907 Beginning of the Young Turks movement. | 1907 Inauguration of an elected Filipino legislature. |
| 1908 Under international pressure, King Leopold II of Belgium is forced to cede the Congo to the Belgian Government. | 1908 Office International d'Hygiène Publique (OIHP) established in Paris. | 1908 A total of 30 newspapers are published in Palestine. | 1908 Formation of Budi Utomo; the first Indonesian independence movement. |
| | | 1908 The British occupation suppresses the revolt led by Abdel Kadir Wad Habbouba in Sudan. | 1908 *My Country*, by Australian poet Dorothea Mackellar. |
| | | 1908 Establishment of the University of Cairo. | |
| | | 1908 Arab Women's Organization established in Jaffa. | |
| 1909 Portugal conquers Beafada, Guinea-Bissau. | 1909 Foundation of the German Society for Sociology. | | |
| | 1909 Italian Poet Filippo Tommaso Marinetti publishes the *Futurist Manifesto*. | | |
| | 1909 Picasso and Braque develop cubism. | | |

| EAST ASIA | THE AMERICAS | INTERNATIONAL EVENTS |
|---|---|---|
| | 1900   General Electric Research Laboratory established in the US. | 1900   First World Congress of History held in Paris. |
| 1901   Treaty concluded between China and the eight-nation alliance following China's defeat in the Boxer Rebellion. | | |
| 1902   The first Anglo-Japanese Alliance concluded. | | |
| | 1903   Jose Batlle y Ordóñez elected President of Uruguay. | |
| | 1903   Wilbur and Orville Wright make the first piloted flight in a power-driven airplane. | |
| 1904   Outbreak of the Russo-Japanese War. | | |
| 1905   *Dingjun Mountain* by Ren Qingtai marks the beginning of Chinese filmmaking. | 1905   American Society for Sociology established. | |
| 1905   Chinese revolutionary leader Sun Yat-sen proclaims the Three Principles of the People. | 1905   *Songs of Life and Hope*, by Nicaraguan poet Rubén Darío. | |
| | 1906   An earthquake devastates San Francisco (USA). | 1906   Second Geneva Convention. |
| | 1908   Creation of the Anglo-American Cataloging Code. | 1908   International Health Office established in Paris. |
| | 1908   'Country Life Movement' in the US. | |
| | 1909   Ford launches the Model T automobile. | |

| SUB-SAHARAN AFRICA (Cont.) | EUROPE (Cont.) | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB (Cont.) | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA (Cont.) |
|---|---|---|---|
| | 1909 Sergei Diaghilev establishes the avant-garde dance troupe, les Ballets Russes. | | |
| 1910 Border adjustment between German and French possessions in Cameroon. | 1910 *First Abstract Watercolour*, by Wassily Kandinsky. | 1910 First kibbutz established in Palestine. | 1910 Indian Press Act passed by the British government in India. |
| 1910 Establishment of a branch of the Pasteur Institute specializing in the study of sleeping sickness in Brazzaville, Congo. | 1910 Republican regime in Portugal. | | |
| 1910 Portuguese conquest of Muhungo, Kasange and regions around the Cuango River. | | | |
| 1910 Establishment of the Union of South Africa. | | | |
| 1911 Portugal's Republican regime expels Portuguese Jesuits in Mozambique. | 1911 New Zealand-born physicist Ernest Rutherford publishes a model of the atom. | 1911 Italy invades Libya. | 1911 First national census conducted in Australia. |
| | 1911 Founding of *Der Blaue Reiter* group, major proponent of German Expressionism. | | |
| | 1911 Norwegian explorers led by Roald Amundsen are the first humans to reach the South Pole. | | |
| | 1911 Official Secrets Act passed by the British Parliament (updated in 1920, 1939 and 1989). | | |
| | 1911–1912 Wassily Kandinsky publishes *Concerning the Spiritual in Art*. | | |
| 1912 Establishment of the African National Congress in South Africa. | 1912 The RMS *Titanic* sinks in the North Atlantic. | 1912 Jewish colonizers in Palestine produce the first Zionist propaganda films. | |
| 1912 Nomination of Norton de Matos as governor of Angola. | 1912 German scientist Alfred Wegener presents his theory of continental drift. | 1912 Under the Treaty of Fez, Morocco becomes a French protectorate. | |
| | 1912 Olympic Games held in Stockholm; the first use of electronic timing devices. | | |
| | 1912 *Campos de Castilla*, by Spanish poet Antonio Machado. | | |
| | 1912 *Pierrot Lunaire* by Viennese composer Arnold Schoenberg. | | |
| 1913 The first microbiology laboratory set up in Saint-Louis (Senegal), in 1896, is transferred to Dakar. | 1913 *Totem and Taboo* by Sigmund Freud. | 1913 Ahmad al-Sharif proclaims the formation of the Sanussi Government after defeating the Italian troops at Derna (Libya). | 1913 Premiere of *Raja Harischandra*, the first Indian feature film. |
| 1913 Muhammad bin Abubakar publishes the *Epic of Liyongo Fumo* based on an ancient South African oral tradition. | 1913 Riotous Paris premiere of avant-garde ballet *The Rite of Spring* composed by Igor Stravinsky. | | 1913 The Indian poet Rabindranath Tagore is the first Asian to win the Nobel Prize in Literature. |
| 1913 People's rebellion in the State of Cuango, Angola, under the leadership of Alvaro Buta. | | | |
| | 1914 Archduke Franz Ferdinand of Austria is assassinated by Serbian-assisted terrorists in Sarajevo. | 1914 The Ottoman Empire enters the First World War as an ally of Germany. | 1914 The Defense of India Act imposes rigid censorship of the press. |
| | 1914 Germany and Austria declare war on the Allied Powers. Beginning of the First World War. | 1914 *Zaynab*, by Egyptian author Muhammad Husayn Haykal. | |
| | | 1914 Kuwait and Egypt are administered as British protectorates. | |
| 1915 French Governor-General Clozel founds Historical and Scientific Studies Committee. | 1915 *The Metamorphosis*, by Franz Kafka. | | |
| 1915 Congolese Research Society is founded. | 1915 French writer and pacifist Romain Rolland is awarded the Nobel Prize in Literature. | | |
| 1915 Portugal takes control of the Balantas and Mandingar groups in the north-west region of Guinea-Bissau. | 1915 Russian artist Kasimir Malevich launches Suprematism. | | |
| 1916 The end of the rubber trade in Angola. | 1916 Albert Einstein publishes the general theory of relativity. | 1916 Arab uprising against Ottoman rule. | 1916 The US Congress passes the Philippine Autonomy Act promising eventual independence of the country. |
| 1916 Diamond mining begins operation in Dramang, Angola. | 1916 Russian Sociological Society founded. | 1916 Formation of the Wafd party in Egypt. | |
| | | 1916 The Sykes-Picot Agreement signed by France and Britain. | |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| 1910 Japan formally annexes Korea. | 1910 The Putumayo Scandal involving mistreatment of indigenous peoples by rubber exploiters in Amazonia.<br>1910 The telephone becomes the principal means of communication in North America.<br>1910 The Mexican Revolution: Peasant uprising against the dictatorship of Porfiro Diaz. | 1910 At the First International Women's Conference in Copenhagen, the Socialist International declares 8 March 'International Women's Day'. |
| 1911 China's ruling Qing Dynasty is overthrown and the Republic of China established. | 1911 First movie studio opens in Hollywood.<br>1911 The Carnegie Corporation is founded by US steel magnate Andrew Carnegie.<br>1911 The 'rediscovery' of the ancient Inca site Machu Picchu in Peru. | |
| 1912 Yoshihito, the Taisho Emperor, ascends to the Japanese throne. | | 1912 International Opium Convention. |
| | 1913 The Armory Show of Contemporary Art in New York City.<br>1913 Creation of the Rockefeller Foundation by oil baron John D. Rockefeller. | |
| 1914 Japan declares war on Germany.<br>1914 The Chinese Society of Science is established. | 1914 The Universal Negro Improvement Association (UNIA) is founded by Marcus Garvey in Jamaica.<br>1914 Inauguration of the Panama Canal. | |
| 1915 Japan presents the Twenty-One Demands to China.<br>1915 *Grass on the Wayside*, the autobiography of Japanese writer Soseki Natsume.<br>1915 First issue of the Chinese revolutionary journal *New Youth*.<br>1915 First issue of the Chinese journal *Science*.<br>1916 *Shibue Chusai*, by Japanese writer Ogai Mori. | 1915 The first long-distance conversation via radio made by AT&T.<br>1915 Premiere of *The Birth of a Nation*, by D.W. Griffith.<br>1915 *Los de Abajo (The Underdogs)*, by Mexican author Mariano Azuela.<br>1915 *Spoon River Anthology*, by US writer E. L. Masters.<br>1916 Hipolito Yrigoyen elected president of Argentina.<br>1916 Publication of *Chicago* by US poet and historian Carl Sandburg. | |

| SUB-SAHARAN AFRICA *(Cont.)* | EUROPE *(Cont.)* | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* |
|---|---|---|---|
| | 1916 Posthumous publication of the work of Swiss linguist Ferdinand de Saussure. | | |
| | 1916 Department of Scientific and Industrial Research founded in Great Britain. | | |
| | 1916 The dada movement founded in Zurich by Romanian poet Tristan Tzara. | | |
| | 1917 Russian Revolution – the Bolsheviks seize power from the tsar. | 1917 With the assistance of T. E. Lawrence (Lawrence of Arabia), Arab forces drive the Turks out of Aqaba. | 1917 Publication of the first issue of *Nasha Gazeta* (Our Newspaper) in Tashkent (Uzbekistan). |
| | 1917 Beginning of the Spanish Flu epidemic in Western Europe. | 1917 Balfour Declaration supports a Jewish homeland in Palestine. | |
| | 1917 Young Moscow artists launch the left-wing art journal *LEF*. | | |
| 1918 A popular rebellion in Cuango (Angola) is suppressed. | 1918 English philosopher Bertrand Russell loses his professorship at Trinity College and is imprisoned for his pacifist activities. | 1918 End of the First World War. Britain takes control of Palestine and Iraq. | 1918 Creation of the Turkestan People's University. |
| | 1918 Treaty of Brest-Litovsk. | 1918 Yemen proclaims its independence. | 1918 The Turkestan Congress of Soviets recognizes the local language as a state language. |
| | 1918 The Soviet Government decrees a new spelling system to eliminate illiteracy. | | |
| | 1918 The end of the Habsburg Empire. | | |
| | 1918 Women win the right to vote in Great Britain. | | |
| 1919 American W. E. B. Dubois organizes the First Pan-African Congress in Paris. | 1919 Creation of the Weimar Republic. | 1919 Egyptian revolt against British rule. | 1919 The Amristar massacre in India. |
| | 1919 Mussolini founds the Italian Fascist party. | | 1919 The Government of India Act grants increased authority to central and provincial legislative councils. |
| | 1919 Higher education programme adopted in Russia. | | 1919 Amanullah becomes King of Afghanistan following the assassination of his father King Habibullah. Amanullah undertakes widespread reforms including compulsory primary school education. |
| | 1919 The socialist experiment fails in Hungary. | | |
| | 1919 Arthur Eddington leads an expedition to observe a solar eclipse on the Equator. | | |
| | 1919 French recognized as the diplomatic language for international treaties. | | 1919 Britain grants Afghanistan the right to conduct its own foreign affairs. |
| | 1919 Signature of the Treaty of Versailles, leading to the creation of the League of Nations. | | |
| | 1919 Women win the right to vote in Germany. | | |
| | 1919 Bauhaus founded in Weimar by Walter Gropius. | | |
| | 1919 Russian Constructivist artist Tatlin receives the commission for *The Monument to the Third International*. | | |
| | 1919 French replaces German as the judicial and educational language of Alsace-Lorraine. | | |
| 1920 Invention of the Osmania alphabet by Uthman Yusuf Keradid (Somali). | 1920 Food shortages in Germany. | 1920 Lebanon and Syria become a French protectorate. | 1920 Mohandas Karamchand 'Mahatma' Gandhi leads the Indian Congress Party in a civil disobedience campaign against British colonial rule. |
| 1920 Establishment of various experimental botanical gardens in French colonies (Côte d'Ivoire, Mali and Congo). | 1920 Olympic Games held in Antwerp, Belgium. | 1920 Emergence of nationalism movements in Egypt, Sudan, Syria, Lebanon, Tunisia and Algeria. | |
| | 1920 Electrification projects for Soviet Russia. | | 1920 Creation of the Central Asian University in Tashkent (Uzbekistan). |
| | 1920 Dutch artist Piet Mondriaan publishes *Neo-Plasticism*, manifesto of De Stijl movement. | 1920 Transjordan becomes part of the British mandate of Palestine. | |
| 1921 Establishment of the Makerere trade school (Uganda), which becomes a full secondary school in 1933. | 1921 End of the Anglo-Irish War and establishment of the independent Irish Republic. | 1921 The British recognize Abdullah ibn Hussein as ruler of Transjordan. | 1921 Britain grants Afghanistan full independence. |
| | 1921 Publication of Wittgenstein's *Tractatus Logico-Philosophicus*. | | 1921 The Constitution of the Bukharan People's Soviet Republic adopted. |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| 1917 The Institute of Physical and Chemical Research founded in Japan. | 1917 New York-based French artist Marcel Duchamp exhibits *Fountain,* one of the century's most influential works of art. | |
| 1917 *Manifesto,* by Chinese writer Hu Shi. | 1917 The first known recording of samba music in Brazil. | |
| 1917 *Cruelty,* by Korean writer Li Koang. | 1917 The USA enters the First World War. | |
| 1917 *Heartlessness,* by Korean writer Yi Kwang-su. | 1917 Mexican Constitution. | |
| 1917 Foundation of the first Korean schools devoted to scientific and technological training. | 1917 'Back to Africa' movement is launched by Marcus Garvey in New York. | |
| 1918 *The Hell Screen,* by Japanese writer Ryunosuke Akutagawa. | | |
| 1918 Inauguration of the Japanese Aeronautical Research Institute. | | |
| 1918 *A Madman's Diary,* by Chinese writer Lu Xun. | | |
| | | 1919 Treaty of Versailles provides for the creation of the League of Nations. |
| | | 1919 Creation of the International Labour Association. |
| 1919 The May Fourth Movement in China. | 1919 *Winesburg, Ohio,* by US writer Sherwood Anderson. | |
| 1919 *A Certain Woman,* by Japanese writer Takeo Arishima. | 1919 US women win the right to vote. | |
| 1919 March First Movement protests colonial rule in Korea. | | |
| 1919 *Fireworks,* by Korean poet Chu Yo-han. | | |
| 1919 *The Korean Science History,* by Hong Yi-sup. | | |
| | | 1920 International Financial Conference held in Brussels. |
| | 1920 Arturo Alessandri elected president of Chile. | |
| | 1920 First Pan-American Congress of Architects in Montevideo. | |
| | 1920 First commercial radio station, KDKA, established in the USA by Westinghouse. | |
| | 1920 Invention of the klystron and magnetron. | |
| 1921 Shen Yanbing, Ye Shengtao and Zheng Zhenduo establish the Society of Literary Study in China. | 1921 Mexican Minister of Education José Vasconcelos launches a 'cultural crusade' promoting educational rights for indigenous peoples. | 1921 Creation of the Permanent Court of International Justice, the judicial body of the League of Nations. |
| | | 1921 Refugee Organisation is established by the League of Nations. |
| | | 1921 First International Conference on Communication and Transit in Barcelona. |
| | | 1921 International Conference on the Traffic in Women and Children in Geneva. |

| SUB-SAHARAN AFRICA (Cont.) | EUROPE (Cont.) | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB (Cont.) | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA (Cont.) |
|---|---|---|---|
| 1921 The anti-colonial, faith-based Kimbanguist movement emerges in Belgian Congo under the leadership of Kimbangu.<br>1921 Establishment of the East African Association.<br>1921 Establishment of a legislative council in Luanda, Angola.<br>1921 Formation of the Communist Party of South Africa.<br>1921 The Second Pan-African Congress takes place in London, Brussels and Paris. | 1921 *Women in Love*, by D. H. Lawrence.<br>1921 Albert Einstein is awarded the Nobel Prize in Physics.<br>1921 *Celebes*, by German artist Max Ernst. | | |
| 1922 Members of the Tuskegee Institute (USA) visit Africa to propagate the philosophy of 'appropriate policies for the education of blacks'. | 1922 Mussolini becomes prime minister of Italy.<br>1922 Numerous dissident Russian intellectuals are forcibly deported.<br>1922 Stalin becomes Secretary General of the Russian Communist Party.<br>1922 *Ulysses*, by James Joyce, published in Paris.<br>1922 *Siddhartha*, by German writer Herman Hesse.<br>1922 *The Waste Land*, by American-born British poet T. S. Eliot.<br>1922 *Tristia*, by Russian poet Ossip Mandelstam.<br>1922 Central Censorship Office established in Russia.<br>1922 Creation of the Union of Soviet Socialist Republics (USSR), the world's first communist state. | 1922 The British declare Egyptian independence. | 1922 The Indian Press Act of 1910 is repealed.<br>1922 Mahatma Gandhi is tried for sedition and sentenced to six years' imprisonment.<br>1922 Excavations begin as Afghanistan grants France exclusive rights to conduct archaeological research in the country.<br>1922 Establishment of the University of Delhi. |
| 1923 Establishment of an Advisory Committee within the British colonial office to coordinate education policy throughout English-speaking Africa.<br>1923 Umar al-Mukhtar leads the national resistance movement against the Italian occupation of Libya.<br>1923 The Moçamedes and Sá Bandeira (Lubango) railway line built in Angola. | 1923 *Towards a New Architecture*, by architect and planner Le Corbusier.<br>1923 General Primo De Rivera assumes power in Spain with the support of King Alfonso XIII.<br>1923 *History and Class Consciousness*, by Hungarian philosopher György Lukacs.<br>1923 *The Rocket into Planetary Space*, by German scientist Hermann Oberth.<br>1923 Irish poet W. B. Yeats awarded the Nobel Prize in Literature.<br>1923 *Pro Eto*, by Soviet poet Vladimir Mayakovsky.<br>1923 *Six Characters in Search of an Author*, by Italian playwright Luigi Pirandello. | 1923 *The Prophet*, by Lebanese poet Khalil Gibran.<br>1923 Mustafa Kemal proclaims the Republic of Turkey, marking the end of the Ottoman Empire. The Islamic caliphate is abolished.<br>1923 Umar al Mukhtar leads Libyan resistance against the Italian occupation.<br>1923 Foundation of the Misr Bank in Egypt.<br>1923 Egypt becomes a constitutional monarchy with limited autonomy.<br>1923 Publication of Jordan's official government newspaper *Al-Sharq al-Arabi*. | 1923 *Indian Philosophy*, by S. Radhakrishnan.<br>1923 Afghanistan adopts its first constitution. All Afghans are given equal rights and citizenship. |
| 1924 The microbiology laboratory in Dakar becomes part of the Pasteur Institute network in French Africa.<br>1924 Beginning of air transport across the Sahara. | 1924 Death of Lenin.<br>1924 First Winter Olympics held in Chamonix, France.<br>1924 *The Magic Mountain*, by German novelist Thomas Mann.<br>1924 *Corydon*, by French author André Gide.<br>1924 André Breton publishes a first *Surrealist Manifesto*, and painter André Masson experiments with 'automatism'.<br>1924 *Passage to India*, by British writer E. M. Forster. | 1924 Abdul Aziz Ibn Saud becomes ruler of Saudi Arabia. | 1924 Mahatma Gandhi is released from prison on medical grounds. |
| 1925 *Chaka*, by Lesotho writer Thomas Mofolo. | 1925 Single-party rule in Italy under Mussolini.<br>1925 *The Battleship Potemkin*, by Soviet film director S. Eisenstein. | 1925 Reza Shah Pahlavi begins new dynasty in Iran.<br>1925 Hebrew University established in Jerusalem. | 1925 The Indian scientist C. V. Raman begins pioneering work on molecular scattering. |

| EAST ASIA *(Cont.)* | | THE AMERICAS *(Cont.)* | | INTERNATIONAL EVENTS *(Cont.)* | |
|---|---|---|---|---|---|
| 1921 | Founding of the Mongolian People's Government. | 1921 | US Congress passes the Emergency Quota Act restricting immigration. | | |
| 1921 | Mongolia's first primary school. | 1921 | Canadian scientists Frederick Banting and Charles Best isolate insulin. | | |
| 1921 | Foundation of Mongolia's first scientific organization, the Institute of Economics. | | | | |
| 1921 | *The Goddess*, by Chinese Poet Guo Moruo. | | | | |
| 1921 | *Shipwreck*, by Chinese writer Yu Dafu. | | | | |
| 1921 | The Tokyo Astronomical Observatory established. | | | | |
| 1921 | *Eastern and Western Cultures and their Philosophies*, by Chinese thinker Liang Shuming. | | | | |
| 1921 | Foundation of the Chinese Communist Party. | | | | |
| 1921 | The Taiwanese Culture Association founded. | | | | |
| 1922 | The Nine Power Treaty checking Japan's aggression against China concluded at the Washington Conference on disarmament. | 1922 | First Semana de Arte Moderno cultural festival in São Paulo, Brazil. | 1922 | Washington Disarmament Conference. |
| | | 1922 | *Trilce*, by Peruvian poet César Vallejo. | 1922 | League of Nations establishes the Intellectual Cooperation Committee. |
| 1922 | The Institute of Biology established in Nanjing. | 1923 | Creation of the Walt Disney Company, California-based media and entertainment giant. | 1922 | Warsaw Health Conference. |
| 1922 | *Barriers*, by Chinese writer Ye Shengtao. | 1922 | *Babbit*, by US writer Sinclair Lewis. | | |
| 1923 | Founding of New Trend School; Korean literary movement. | 1923 | *Newfoundland Verse*, by Canadian poet E. J. Pratt. | 1923 | International Convention for the Suppression of the Circulation of and Traffic in Obscene Publications concluded in Geneva. |
| 1923 | The Great Kanto earthquake devastates Tokyo. | | | 1923 | Foundation of the Health Organisation under the League of Nations. |
| 1924 | The Japan Sociological Society established. | 1924 | *Rhapsody in Blue*, by US composer George Gershwin. | 1924 | Geneva Declaration on the Rights of the Child. |
| 1924 | Mongolia's legislative assembly ratifies constitution and proclaims the People's Republic of Mongolia. | 1924 | Second Pan-American Architectural Congress in Santiago, Chile. | | |
| | | 1924 | The first radio advertising spot is broadcast. | | |
| | | 1924 | *The Vortex*, by Colombian writer José Eustacio Rivera. | | |
| | | 1924 | The Indian Citizenship Act gives Native Americans citizenship and the right to vote in the USA. | | |
| 1925 | *The Vase*, by Chinese poet Guo Moruo. | 1925 | *The Great Gatsby*, by F. Scott Fitzergald, epitomizes the Jazz Age. | 1925 | International Congress of Official Tourist Traffic Associations (IUOTO) established in the Hague. |
| 1925 | *Azaleas*, by Korean poet Kim So-wol. | | | 1925 | Geneva Conference for the Supervision of the International Traffic in Arms. |

| SUB-SAHARAN AFRICA (*Cont.*) | EUROPE (*Cont.*) | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB (*Cont.*) | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA (*Cont.*) |
|---|---|---|---|
| | 1925 First complete performance of the opera *Wozzeck*, by Austrian composer Alban Berg.<br>1925 Russian Association of Proletarian Writers (RAPP) established. | 1925 Oil-rich Khuzistan is conquered by Iran. | 11925 Indian physicist Satyendra Nath Bose co-authors Albert Einstein's paper on quantum theory.<br>1925 *Telegram*, by Indonesian writer Putu Wijaya. |
| 1926 São Tomé and the Guinea Gulf ruled as separate territories; the legislative council is replaced by a consultative council. | 1926 Max Born proposes the probabilistic interpretation of the wave function.<br>1926 Scottish engineer John Logie Baird demonstrates the first television.<br>1926 *The Red Cavalry*, by Soviet writer Isaac Babel.<br>1926 Germany joins the League of Nations.<br>1927 Heisenberg proposes the uncertainty principle.<br>1927 Big Bang theory, by Belgian astronomer Georges Lemaître.<br>1927 *Being and Time*, by German philosopher Martin Heidegger.<br>1927 *To the Lighthouse*, by English writer Virginia Woolf.<br>1927 Publication of the final volume of *Remembrance of Things Past*, by Marcel Proust.<br>1927 *Metropolis*, by German film director Fritz Lang. | 1926 Abdul Aziz Ibn Saud becomes the King of Hijaz in Saudi Arabia.<br>1927 Launching of Jordan's first daily newspaper, *al-Urdun*. | 1927 *Murugan the Tiller*, by Indian writer K. S. Venkataramani. |
| | 1928 Scottish bacteriologist Sir Alexander Fleming discovers penicillin.<br>1928 *The Well of Loneliness*, by Radclyffe Hall is banned for obscenity because of its open treatment of lesbianism.<br>1928 Dirac derives a relativistic quantum equation of the electron.<br>1928 Stalin institutes the first five-year plan.<br>1928 At the Amsterdam Olympic Games, women are permitted to compete in gymnastic and athletic events.<br>1928 *Lady Chatterley's Lover*, by D. H. Lawrence, is privately printed in Italy and banned in England and the USA for over 30 years.<br>1928 *Romancero Gitano*, by Spanish poet Federico Garcia Lorca.<br>1928 *And Quiet Flows the Don*, by Soviet writer Mikhail Sholokhov.<br>1928 *The Threepenny Opera*, by Bertolt Brecht.<br>1928 *Don Juan*, by Belgian writer Michel de Ghelderode.<br>1928 Villa Savoye designed by Le Corbusier.<br>1928 Eugenio Casanova's archive management manual published. | 1928 As part of Kemal's attempts to Westernize Turkey, the Latin alphabet replaces Arabic script.<br>1928 The Muslim Brotherhood established in Egypt. | 1928 Revolt against the social reforms of Afghan King Amanullah. |
| 1929 The British colonial Government of Nigeria establishes the first two government colleges to teach science. | 1929 Colonial Development Act passed in the UK.<br>1929 The London School of Hygiene and Tropical Medicine founded.<br>1929 Surrealist film *Un Chien Andalou*, by Luis Buñuel and Salvador Dali. | 1929 Riots in Palestine over access to the Wailing Wall in Jerusalem. | 1929 Insurgents, led by Bacha Saqao, capture Kabul. King Amanullah abdicates and is replaced by Nader Khan.<br>1929 *The Story of My Experiments with Truth*, the autobiography of Mahatma Gandhi. |

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| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| 1925    The Korean Proletariat Artists Federation founded. | 1925    Construction of the Salvo Palace in Montevideo.<br>1925    *An American Tragedy*, by US writer Theodore Dreiser.<br>1925    *Of Time and the River*, by US writer Thomas Wolfe.<br>1925    *La raza cósmica*, by Mexican writer José Vasconcelos.<br>1925    *Pau Brasil*, by Brazilian poet Oswald de Andrade. | |
| 1926    Hirohito becomes emperor of Japan. | 1926    Robert Goddard develops the first liquid-fuelled rocket.<br>1926    Creation of National Broadcasting Company (NBC) with 24 stations in the USA and an audience of 12 million. | 1926    Formation of the Comité International des Sciences Historiques (CISH).<br>1926    Creation of the International Institute of Intellectual Co-operation (IIIC) in Paris. |
| 1927    Chiang Kai-shek launches a *coup d'état* and establishes the Nationalist Government in Nanjing. Beginning of the Chinese Civil War.<br>1927    *Wild Herbs*, by Chinese writer Lu Xun.<br>1927    *Cogwheels*, by Japanese writer Ryunosuke Akutagawa. | 1927    Charles Lindbergh pilots the first non-stop transatlantic solo flight (New York to Paris).<br>1927    Third Pan-American Architectural Congress in Buenos Aires.<br>1927    First Academy Awards in Hollywood.<br>1927    RCA and Western Electric introduce sound in movies. *The Jazz Singer* is the first full-length 'talkie'.<br>1927    Execution of both defendants in the controversial Sacco and Vanzetti murder trial.<br>1927    Harold Black invents the wave translation system. | 1927    International Federation of Library Associations (IFLA) is founded in London.<br>1927    League of Nation's First International Economic Conference.<br>1927    The International Educational Cinematographic Institute (IECI) established in Rome.<br>1927    International Conference of Press Experts hosted by the League of Nations.<br>1927    League of Nations adopts the General Act for the Pacific Settlement of International Disputes. |
| 1928    Kuomintang (Nationalist Party of China) seizes power in Beijing and receives widespread diplomatic recognition.<br>1928    *Ni Huanzi*, by Chinese writer Ye Shengtao.<br>1928    A proletarian literary movement created in areas of China ruled by the Kuomintang.<br>1928    The Nanjing Nationalist Government establishes the Academia Sinica.<br>1928    Large-scale excavations of the ruins of the Shang Dynasty in Henan, China. | 1928    Re-election of Hipolito Yrigoyen as president of Argentina.<br>1928    First Mickey Mouse cartoon.<br>1928    *The Sun Also Rises*, by US writer Ernest Hemingway. | 1928    Kellogg-Briand Pact (Pact of Paris). |
| 1929    The Nanjing Nationalist Government establishes the Beijing Academy.<br>1929    Pei Wenzhong discovers the skeleton of Beijing Man.<br>1929    *Crab-Canning Boat*, by Japanese writer Takiji Kobayashi. | 1929    Wall Street crash precipitates a worldwide depression.<br>1929    Hubble's Law concerning the distance of galaxies.<br>1929    Opening of New York's Museum of Modern Art (MoMA). | |

| SUB-SAHARAN AFRICA *(Cont.)* | EUROPE *(Cont.)* | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* |
|---|---|---|---|
| 1929 The codification of labour law guidelines in Portuguese colonies. | 1929 The Lateran Treaty.<br>1929 Ibero-American Festival in Seville and Barcelona, Spain. Barcelona Pavilion designed by German architect Mies van der Rohe.<br>1929 First broadcast of Radio Moscow.<br>1929 First broadcast of German Weltrundfunksender.<br>1929 *Berlin Alexanderplatz*, by Alfred Döblin, is declared degenerate by the Nazis.<br>1929 Thomas Mann awarded the Nobel Prize in Literature.<br>1929 *The Indifferent Ones*, by Italian writer Alberto Moravia. | | |
| 1930 Ras Tafari Makonnen, adopting the name Haile Selassie, is crowned Emperor of Ethiopia.<br>1930 Italy consolidates its control over Somaliland.<br>1930 *Mhudi*, by South African writer Tshekisho Plaatje.<br>1930 Diamonds account for 25 per cent of Angolan exports. | 1930 Hitler's National Socialist Party secures 20 per cent of the vote in Reichstag elections.<br>1930 Publication of the first volume of *The Man Without Qualities*, by Austrian writer Robert Musil.<br>1930 S. Lebedev elaborates the industrial production of synthetic rubber.<br>1930 Social Realism prevails in official Soviet arts.<br>1930 Lenin's mausoleum built in Moscow's Red Square.<br>1930 Hitler wins 107 seats in the legislative elections.<br>1930 *The Life of Arsenev*, by Russian writer Ivan Bunin. | 1930 Kuwait reform movement begins.<br>1930 *Al-Ayyâm (Days)*, by Egyptian author Taha Husayn.<br>1930 Birth of the Iranian film industry. | 1930 *The Fortunes of Richard Mahony*, by Australian writer Ethel Richardson.<br>1930 Indian scientist C. V. Raman wins the Nobel Prize in Physics for his discovery of the inelastic scattering of light (the Raman effect). |
| 1931 The Union of South Africa joins the British Commonwealth. | 1931 *The Persistence of Memory*, by Spanish artist Salvador Dali.<br>1931 The new Spanish Republic voted into power. King Alfonso XIII leaves the country.<br>1931 Compulsory universal primary education introduced in the USSR.<br>1931 Central Puppet Theatre founded in the USSR.<br>1931 *The Maid Silja*, by Finnish writer Frans Sillanpää.<br>1931 The first electron microscope is developed by Max Knoll and Ernst Ruska.<br>1931 First broadcast of French Colonial Radio.<br>1931 First broadcast of Radio Vaticana. | 1931 Kadouri Agricultural School established in Palestine.<br>1931 Execution of Umar al Mukhtar, Libyan resistance leader. | 1931 Britain grants Ceylon (Sri Lanka) limited self-rule and universal franchise.<br>1931 The Indian Press (Emergency Powers) Act.<br>1931 Afghan King Nader Khan issues a new constitution. |
| | 1932 Hitler's National Socialist Party obtains 40 per cent of the electoral vote in Germany.<br>1932 Russian Association of Proletarian Writers dissolved.<br>1932 The Union of Soviet Writers established.<br>1932 Hindenburg wins a majority in the German presidential elections.<br>1932 James Chadwick discovers the neutron.<br>1932 Exhibition of the Fascist Revolution in Rome.<br>1932 BBC begins broadcasting in Britain.<br>1932 English writer John Galsworthy awarded Nobel Prize in Literature.<br>1932 *Voyage au bout de la nuit*, by French writer Louis-Ferdinand Céline.<br>1932 *Brave New World*, by English writer Aldous Huxley. | 1932 Abdul Aziz Ibn Saud founds the Kingdom of Saudi Arabia.<br>1932 Discovery of oil in Bahrain.<br>1932 Iraq achieves independence. | 1932 A coup d'état transforms the government of Siam (Thailand) from an absolute to a constitutional monarchy. |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| 1929　*Before the Dawn*, by Japanese writer Toson Shimazaki. | 1929　*Doña Bárbara*, by Venezuelan writer Rómulo Gallegos.<br>1929　*The Sound and the Fury*, by US writer William Faulkner. | |
| 1930　The Chinese League of Leftist Writers founded. | 1930　Getúlio Vargas seizes power in Brazil.<br>1930　First World Cup soccer competition held in Uruguay.<br>1930　Sinclair Lewis is the first American awarded the Nobel Prize in Literature.<br>1930　Publication of the first novel in the *U.S.A.* trilogy by John Dos Passos.<br>1930　Creation of the black nationalist movement, Nation of Islam. | 1930　Creation of the Nansen International Office for Refugees. |
| 1931　Japan invades Manchuria.<br>1931　Establishment of the Society of Korean Language Research.<br>1931　Release of the first Japanese 'talkie', *The Neighbor's Wife and Mine*. | 1931　*Altazor*, by Chilean poet Vicente Huidobro.<br>1931　Construction of the Empire State Building in New York, the world's highest skyscraper until 1972. | 1931　Treaty of Westminster creates the British Commonwealth.<br>1931　League of Nations adopts the General Convention to Improve the Means of Preventing War. |
| 1932　The Society for the Study of Materialism founded in Japan.<br>1932　Japan Society for Promotion of Science established. | 1932　Beginning of four-term presidency of Franklin Delano Roosevelt, father of the New Deal.<br>1932　Radio noise emitted from the centre of the Milky Way galaxy is identified by AT&T Bell Labs in the USA.<br>1932　The term 'International Style' is launched in US architectural circles.<br>1932　US physicist Carl Anderson discovers positron.<br>1932　Olympic Games held in Los Angeles.<br>1932　Publication of the first part of the *Studs Lonigan* trilogy by US writer James T. Farrell. | 1932　Convention for the Reduction and Limitation of Armaments. |

| SUB-SAHARAN AFRICA *(Cont.)* | EUROPE *(Cont.)* | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* |
|---|---|---|---|
| | 1932 Inauguration of Venice Film Festival as part of the Venice Biennale. | | |
| | 1933 Hitler is appointed Chancellor, marking the beginning of the Third Reich. Conflagration of the Reichstag. | 1933 First issue of the Lebanese daily newspaper *An-Nahar*. | 1933 Following the assassination of King Nader Khan, Afghanistan is ruled by his son Mohammad Zahir and Prime Minister Hashem Khan. |
| | 1933 USSR recognized by the USA. | 1933 Saudi Arabia awards an oil concession to Standard Oil of California. | |
| | 1933 The first Soviet stratospheric balloon reaches an altitude of 19,000 metres. | | 1933 Prominence of the New Writer School in Indonesia. |
| | 1933 *La Condition humaine*, by André Malraux. | | |
| | 1933 Germany withdraws from the League of Nations. | | |
| | 1933 Decree issued dismissing Jews and socialists from German Civil Services positions. | | |
| | 1933 Exiled Russian writer Ivan Bunin awarded the Nobel Prize in Literature. | | |
| | 1933 *The Executioner*, by Swedish writer Pär Lagerkvist. | | |
| | 1933 The Nazis order the closing of the Bauhaus and establish the first concentration camps. | | |
| 1934 Discovery of humankind's presumed ancestor, *Australopithecus*, in Southern Africa. | 1934 The left coalition is voted out of power in Spain. | 1934 University of Tehran officially inaugurated. | 1934 Indian astrophysicist and politician Meghnad Saha establishes the Indian Science News Association and publishes the influential journal *Science and Culture*. |
| 1934 Leprosy Research Institute is founded in Bamako (French Africa). | 1934 Bauhaus founder, Walter Gropius, flees Nazi Germany and eventually settles in the USA. | 1934 Opening of Misr Studios in Egypt, the leading film studios in the Arab World. | |
| 1934 Establishment of the Kenya African Teachers' Union. | 1934 Assassination of Austrian chancellor Dollfuss by Nazis. | | 1934 *Spur of Morning*, by New Zealand writer Alan Mulgan. |
| | 1934 Artist George Grosz forced to leave Germany. | | |
| | 1934 Italian writer Luigi Pirandello awarded Nobel Prize in Literature. | | |
| | 1934 Adoption of the theory of Socialist Realism requiring all creative people to serve the cause of the Soviet proletariat revolution. | | |
| 1935 *Traduit de la nuit*, by Jean-Joseph Rabearivelo of Madagascar. | 1935 Seventh Congress of the Communist International. | | 1935 Establishment of the Commonwealth of the Philippines. Manuel Quezon becomes the first president. |
| 1935 Invasion and occupation of Ethiopia by Italian Fascist forces. | 1935 Irene and Frédéric Joliot Curie are awarded the Nobel Prix in Physics for the discovery of artificial radioactivity. | | 1935 *Untouchable*, by Indian writer Mulk Raj Anand. |
| | 1935 Robert Watson-Watt granted a patent for radar. | | 1935 A new Government of India Act grants 'provincial autonomy'. |
| | 1935 First publicly broadcast electronic service available in Germany. | | |
| | 1935 Hitler violates Treaty of Versailles by sending German troops into the Rhineland. Mussolini attacks Ethiopia. | | |
| | 1935 German Jews stripped of their citizenship and civil rights. | | |
| 1936 Italy occupies Addis Ababa (Ethiopia) using poison gas. | 1936 Mussolini and Hitler announce the formation of the Rome-Berlin Axis. | 1936 Oil discovered in Kuwait. | 1936 *An Autobiography*, by Indian politician Jawaharlal Nehru. |
| 1936 The Bijagos of Guinea-Bissau surrender to the Portuguese. | 1936 Popular Fronts in Spain and France win parliamentary elections. | 1936 Farouk I becomes King of Egypt. | 1936 *The Gift of a Cow*, by Indian writer Prem Chand. |
| | 1936 The Anti-Comintern pact signed by Germany and Japan. | 1936 Reform movement begins in the Emirate of Dubai. | 1936 *Contemporary Indian Philosophy*, by S. Radhakrishnan. |
| | 1936 Spanish Civil War begins. | | |
| | 1936 Federico García Lorca killed by Spanish nationalist forces. | | |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| 1933 Japan withdraws from the League of Nations. | 1933 *Caetés*, by Brazilian writer Graciliano Ramos. | 1933 World Monetary and Economic Conference held in London. |
| 1933 *Midnight*, by Chinese writer Mao Dun. | 1933 Release of the Hollywood film *King Kong*. | |
| 1933 *Thunderstorm*, by Chinese playwright CaoYu. | 1933 By court decision, ban on *Ulysses*, by James Joyce, is lifted in the USA. | |
| | 1933 The end of Prohibition in the USA. | |
| | 1933 *Cacao*, by Brazilian writer Jorge Amado. | |
| | 1933 Scandal over the depiction of Lenin in a Rockefeller Center mural by Mexican artist Diego Rivera. | |
| 1934 Opening of Mongolia's first movie house. | 1934 Lazaro Cardenas elected president of Mexico. | |
| | 1934 Foundation of the Argentine Association for the Progress of Science. | |
| | 1934 Palacio de Bellas Artes constructed in Mexico. | |
| | 1934 Creation of the United States National Archives. | |
| 1935 Minobe Tatsukichi's theory of the emperor as an organ of the state is officially banned. | 1935 *A Universal History of Infamy*, by Jorge Luis Borges. | 1935 Seventh Congress of the Communist International. |
| | 1935 Construction of the Kavanagh Building in Buenos Aires. | |
| | 1935 Brazilian President, Getúlio Vargas, crushes a leftist uprising. | |
| | 1935 The first full-colour feature motion picture, *Becky Sharp*. | |
| | 1935 Radio manufacturer RCA begins experimental television programmes. | |
| | 1935 The US Government establishes the Federal Art Project to support artists. | |
| | 1935 Invention of nylon. | |
| | 1935 Completion of the Kaufmann house (Fallingwater) by architect Frank Lloyd Wright. | |
| 1936 Japan signs anti-communism treaty with Germany. | 1936 Frequency Modulation (FM) radio launched in the USA. | |
| 1936 *Outlines of Sociology*, by Chinese writer Li Da. | 1936 Eugene O'Neill awarded the Nobel Prize in Literature. | |
| 1936 *Rickshaw*, by Chinese writer Lao She. | | |

| SUB-SAHARAN AFRICA *(Cont.)* | EUROPE *(Cont.)* | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* |
|---|---|---|---|
| | 1936 *The General Theory of Employment, Interest and Money,* by British economist John Maynard Keynes. | | |
| 1937 *Pigments,* by Léon Damas of French Guyana. | 1936 Olympic Games in Berlin. <br> 1937 Stalin establishes dictatorial rule over party and state. | 1937 Creation of the first Lebanese public radio station. | 1937 Filipino becomes the official language of the Philippines. |
| 1937 Formal censorship suggested in South Africa. | 1937 The first Arctic expedition headed by Soviet I. Palanin approaches the North Pole. | 1937 The first vocational school in Palestine is established in Haifa. | |
| 1937 Imperial Airways inaugurates its London-Cairo-Khartoum-Johannesburg service, with connecting flights from Khartoum to Nigeria. | 1937 The Moscow trials begin. <br> 1937 Exhibition of 'Degenerate Art' organized by the Nazis in Munich. | 1937 *Journals of a Rural Assistant District Commissioner,* by Egyptian author Tawfîq al-Hakîm. | |
| | 1937 *Out of Africa,* by Danish writer Karen Blixen (Isak Dinesen). | | |
| | 1937 Bombing of the Basque village Guernica by Nazi and Italian squadrons. | | |
| | 1937 Commissioned by the Spanish Republican Government, *Guernica,* by Pablo Picasso, is exhibited at the International Exposition in Paris. | | |
| | 1937 *Ferdydurke,* by Polish writer Witold Gombrowicz. | | |
| 1938 Creation of IFAN (Institut Français d'Afrique Noire). | 1938 Munich Agreement. <br> 1938 Economist N. Kondratiev is a victim of Stalin's purges. | 1938 Death of Turkish leader Mustafa Kemal Atatürk. | 1938 *Capricornia,* by Australian writer Xavier Herbert. |
| 1938 The Agricultural Institute for Italian Africa is established in Florence, Ethiopia. | 1938 Dissemination of *A Short Course on the History of the Communist Party,* edited by Stalin. | 1938 Discovery of commercial quantities of oil in Saudi Arabia. | 1938 *Kanthapura,* by Indian writer Raja Rao. |
| | 1938 Chamberlain and Daladier agree to dismantle Czechoslovakia. | | |
| | 1938 *Anschluss* proclaimed. | | |
| | 1938 Discovery of Mössbauer effect. | | |
| | 1938 Invention of the ballpoint pen by Hungarian Laszlo Biro. | | |
| | 1938 Royal Air Force officer Frank Whittle invents the jet engine. | | |
| | 1938 Italian teams is victorious at Women's World Cup in France. | | |
| 1939 *Cahier d'un retour au pays natal,* by Martiniquan author and statesman Aimé Césaire. | 1939 Soviet Union signs non-aggression pact with Germany. | 1939 Libya formally incorporated into Italy. | 1939 Siam's name is changed to Thailand. |
| 1939 First junior secondary school founded in Zambia (Northern Rhodesia). | 1939 Literacy level of the Soviet population reaches 95.1 per cent. | | |
| | 1939 First Soviet cyclotron constructed under the direction of I. Kourchatov. | | |
| | 1939 Fall of the Spanish Republic, triumph of Franco. | | |
| | 1939 Mussolini invades Albania. Germany invades Poland. France and Britain declare war on Germany. | | |
| | 1939 Kahn and Strassmann discover nuclear fission in Germany. | | |
| | 1939 First Cannes Film Festival. | | |
| | 1939 *The Rules of the Game,* by French director Jean Renoir. | | |
| | 1939 *Finnegan's Wake,* by James Joyce. | | |
| | 1939 Finnish writer Frans Sillanpää awarded the Nobel Prize in Literature. | | |
| 1940 Portuguese settlers number 44,000 in Angola and 27,000 in Mozambique. | 1940 The Baltic States (Estonia, Latvia and Lithuania) and Moldavia join the Soviet Union. | 1940 *Determination,* first major Egyptian film dealing with social problems. | 1940 A team of scientists, lead by Australian scientist Howard Florey, develops penicillin. |
| 1940 The yellow fever vaccine is developed at the Dakar Pasteur Institute. | 1940 Communist regimes are established in the Baltic states and Moldavia. | | |
| | 1940 Hitler occupies Norway, Denmark, the Netherlands, Luxemburg, Belgium and France. | | |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| 1937 The Marco Polo Bridge Incident. Japan launches full-scale war against China, marking the beginning of the Second World War in Asia. | | |
| 1937 *A Dark Night's Passing*, by Japanese writer Naoya Shiga. | | |
| 1937 *On Practice* and *On Contradiction*, by Mao Zedong. | | |
| | 1938 *Self-Portrait with Monkey*, by Mexican artist Frida Kahlo. | 1938 International Health Conference held in Paris. |
| | | 1938 Foundation of the Fourth International in Paris. |
| | | 1938 Nobel Peace Prize is awarded to the Nansen International Office for Refugees. |
| 1939 *Chinese Geology*, by Li Siguang. | 1939 US physicist Hans Bethe proposes theory of the sources of stellar energy. | |
| | 1939 Grote Reber detects cosmic radio emissions. | |
| | 1940 *The Great Dictator*, by Charlie Chaplin. | 1940 Japan, Germany and Italy sign the Tripartite Pact. |

| SUB-SAHARAN AFRICA *(Cont.)* | | EUROPE *(Cont.)* | | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* | |
|---|---|---|---|---|---|---|---|
| | | 1940 | Leader of the Free French movement in London, General de Gaulle broadcasts his famous '18 June Appeal' on the BBC. | | | | |
| 1941 | The British Army occupies Ethiopia and restores Emperor Haile Selassie to the throne. | 1941 | Germany invades the USSR. | 1941 | Reza Shah abdicates in favour of his son Mohammed. | 1941 | Ho Chi Minh emerges as a leader of the Vietnamese resistance to Japanese occupation. |
| | | 1941 | *The Fall of Paris*, by Soviet writer Ilya Ehrenburg. | | | | |
| 1942 | *Les Contes d'Amadou Koumba*, by Birago Diop. | 1942 | *Obras Completas*, by Portuguese poet Fernando Pessoa. | 1942 | Operation Torch: British and US troops land in North Africa. | 1942 | *The Flame of an Earthen Lamp*, by Indian poet Mahadevi Varma. |
| | | 1942 | *The Stranger*, by French writer Albert Camus. | | | 1942 | Japan assists Indonesia in a revolt against the Dutch wartime government. The Dutch forces are defeated and Sukarno accepts Japan's offer to form a government. |
| 1943 | In Portugal's African colonies, and particularly Mozambique, cotton cultivation is promoted. | 1943 | The Academy of Pedagogy established in the USSR. | 1943 | Lebanon achieves independence. | 1943 | *Aku*, by Indonesian poet Chairil Anwar. |
| | | 1943 | Germany defeated at Stalingrad. | | | | |
| | | 1943 | Danish linguist Louis Hjelmsler develops theory of glossematics. | | | | |
| | | 1943 | *Being and Nothingness*, by Jean-Paul Sartre. | | | | |
| | | 1943 | The uprising of the Warsaw ghetto. | | | | |
| | | 1943 | Italy surrenders. | | | | |
| | | 1943 | *The Glass Bead Game*, by Herman Hesse. | | | | |
| | | 1944 | Beginning of the Greek Civil War. | 1944 | *Last Night on Earth*, by Palestinian poet Mahmûd Darwish. | 1944 | Foundation of the Ceylon (Sri Lanka) Association for the Advancement of Science. |
| | | 1944 | Pablo Picasso joins the French Communist Party. | | | | |
| | | 1944 | D-Day and the Liberation of Paris. | | | | |
| | | 1944 | Iceland declares its independence from Denmark. | | | | |
| | | 1944 | *Our Lady of the Flowers*, by French writer Jean Genet. | | | | |
| 1945 | *Chants d'ombre*, by Senegal's Leopold Senghor. | 1945 | New Labour Party Government in Britain. | 1945 | Foundation of the League of Arab States in Cairo. | 1945 | The French attempt to reestablish colonial rule in Indochina. The Viet Minh resist and the First Indochina War breaks out. |
| 1945 | Plague vaccine is developed at the Madagascar Pasteur Institute. | 1945 | Liberation of Auschwitz concentration camps. Mussolini is executed. Hitler commits suicide. The surrender of Germany. | 1945 | The Society for the Development of National Music founded in Tehran. | 1945 | Indonesia proclaims independence from the Netherlands. |
| 1945 | At the Fifth Pan-African Congress (Manchester Conference), Pan-Africanists and nationalists claim the right to self-determination. | 1945 | *Three Studies for Figures at the Base of a Crucifixion*, by Francis Bacon. | 1945 | Turkey and Lebanon join the United Nations. | 1945 | The Maori Social and Economic Advancement Act is passed in New Zealand. |
| | | 1945 | The Nuremberg trials of Nazi war criminals. | | | | |
| | | 1945 | *Les Enfants du Paradis*, by French director Marcel Carné. | | | | |
| | | 1945 | *A Bridge over the Drina*, by Bosnian writer Ivo Andrič. | | | | |
| | | 1945 | *Animal Farm*, by English writer George Orwell. | | | | |
| | | 1946 | Hermann Hesse awarded the Nobel Prize in Literature. | 1946 | Jordan and Syria achieve independence. | 1946 | The Democratic Republic of Viet Nam (North Viet Nam) adopts its first constitution. |
| | | | | | | 1946 | The Philippines are granted independence from the United States. |
| | | | | | | 1946 | Shah Mahmud Khan becomes prime minister of Afghanistan. |
| | | | | | | 1946 | *The Moving Image*, by Australian writer Judith Wright. |
| 1947 | Kuwame Nkrumah forms the Convention People's Party in Gold Coast (Ghana). | 1947 | Publication of *The Diary of Anne Frank*. | 1947 | UN Resolution 181 recommends establishing two states: Israel and Palestine. | 1947 | The British Viceroy leaves the Indian subcontinent divided into a predominantly Muslim Pakistan and a predominantly Hindu India. |

| EAST ASIA *(Cont.)* | | THE AMERICAS *(Cont.)* | | INTERNATIONAL EVENTS *(Cont.)* | |
|---|---|---|---|---|---|
| 1941 | Mao Zedong's Yan'an address. | 1941 | Publication of *Yawar Fiesta*, by Peruvian writer and anthropologist José Maria Arguedas. | | |
| 1941 | Japanese attack on Pearl Harbor leads to US entry in Second World War. | 1941 | Release of *Citizen Kane*, by Orson Welles. | | |
| | | 1941 | The Japanese attack on Pearl Harbor prompts the US entry into the Second World War. | | |
| 1942 | The Mongolian National University is founded. | 1942 | The first scanning electron microscope (SEM) developed. | | |
| | | 1942 | Italian-born physicist Enrico Fermi builds the world's first nuclear reactor and produces the first nuclear chain reaction. | | |
| 1943 | The Cairo Conference; Churchill, Roosevelt and Chiang Kai-shek meet to decide on a post-war policy for the Far East. | 1943 | The Minnesota Multiphasic Personality Inventory (MMPI) is published. | 1943 | Moscow and Tehran Conferences. |
| | | 1943 | Military coup led by Juan Perón in Argentina. | 1943 | The Vienna Human Rights Conference. |
| | | 1944 | *Masters of the Dew*, by Haitian poet Jacques Roumain. | 1944 | Bretton Woods Agreement creates the International Bank for Reconstruction and Development (precursor to the World Bank) and the International Monetary Fund (IMF). |
| | | 1944 | *Ficciones*, by Jorge Luis Borges. | | |
| 1945 | US drops the first atomic bombs on Hiroshima and Nagasaki (Japan). | 1945 | *Etincelles*, by Haitian writer René Depestre. | 1945 | Second World War ends. |
| 1945 | The Japanese emperor announces unconditional surrender in Second World War and US occupation of the country begins. | 1945 | First issue of the Argentine scientific journal *Ciencia e Investigación*. | 1945 | Yalta and Potsdam Conferences. |
| 1945 | Chinese is one of the official languages of the United Nations. | 1945 | Chilean poet Gabriela Mistral awarded Nobel Prize for Literature. | 1945 | Adoption of the United Nations Charter in San Francisco: creation of the United Nations and UNESCO. |
| 1945 | The Allied leaders agree to establish a four-power trusteeship over Korea at the Yalta Conference. | 1945 | *Black Boy*, by writer African-American Richard Wright. | 1945 | Creation of the specialized UN Agency, the Food and Agriculture Organization (FAO). |
| | | 1945 | *Two Solitudes*, by Canadian writer Hugh MacLennan. | | |
| 1946 | New Japanese Constitution stipulating clearly that sovereignty is formally vested in the people. | 1946 | Juan Perón is elected President of Argentina. | 1946 | Trygve Lie (Norway) becomes the first Secretary General of the United Nations. |
| 1946 | The Federation of Democratic Scientists created in Japan. | | | 1946 | Inauguration of the International Court of Justice, supreme judicial body of the UN. |
| | | | | 1946 | Creation of the United Nations International Children's Emergency Fund (UNICEF). |
| | | | | 1946 | The International Council on Archives. |
| 1947 | *The Spirit of Chinese Philosophy*, by Fung Yu-Lan. | 1947 | Truman Doctrine, which provides US support for countries threatened by foreign domination. | 1947 | General Agreement on Tariffs and Trade (GATT). |
| 1947 | *Cold Nights*, by Chinese writer Ba Jin. | | | 1947 | Paris Peace Treaties. |

| SUB-SAHARAN AFRICA *(Cont.)* | EUROPE *(Cont.)* | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* |
|---|---|---|---|
| 1947 Alioune Diop launches the influential literary journal, *Presence Africaine*. | 1947 Creation of Organisation for European Economic Co-operation (OEEC) forerunner of the OECD. | 1947 First party congress of the pan-Arab Ba'ath Socialist Party in Damascus.<br>1947 Cholera epidemic in Egypt.<br>1947 Dead Sea Scrolls found.<br>1947 The UN General Assembly adopts the partition resolution on the Palestine issue. | 1947 Jawaharlal Nehru becomes India's first prime minister. |
| 1948 Publication of *Anthology of New Negro and Malagasy Poetry* edited by Senghor.<br>1948 The coalition of Afrikaaner nationalists comes to power in South Africa and imposes apartheid.<br>1948 *Cry, The Beloved Country*, by South African novelist Alan Paton. | 1948 USA and Britain counter the Soviet blockade of Berlin with an airlift.<br>1948 Soviet geneticists persecuted in the Lysenko affair.<br>1948 Communists come to power in Czechoslovakia.<br>1948 *The Bicycle Thief*, neo-realist film by Italian director Vittorio De Sica.<br>1948 Olympic Games in London.<br>1948 T. S. Eliot awarded the Nobel Prize in Literature.<br>1948 *Zorba the Greek*, by Greek writer Nikos Kazantzakis.<br>1948 English artist Henry Moore is awarded the International Sculpture Prize at the Venice Biennale.<br>1948 Swiss chemist Paul Hermann Müller is awarded the Nobel Prize for research on DDT.<br>1948 War-torn Europe begins receiving financial assistance from the US Marshall Plan. | 1948 David Ben Gurion proclaims the creation of the State of Israel, unleashing the first Arab-Israeli war. Victorious Israeli forces expel thousands of Palestinian Arabs. | 1948 *The Cunninghams*, by New Zealand writer David Ballantyne.<br>1948 The Union of Burma achieves independence with U Nu as its first prime minister.<br>The First Indo-Pakistani War over the area of Kashmir.<br>1948 Ceylon (Sri Lanka) achieves independence from Great Britain.<br>1948 The assassination of Mahatma Gandhi.<br>1948 The establishment of the University of Sind in Pakistan. |
| | 1949 Council of Mutual Economic Assistance (CMEA) created.<br>1949 *The Second Sex*, by French intellectual Simone de Beauvoir.<br>1949 The first Soviet atomic test.<br>1949 Soviets end blockade of Berlin.<br>1949 *1984*, by George Orwell.<br>1949 Creation of the Council of Europe. | 1949 Weizmann Institute of Science founded in Israel.<br>1949 *The Damned of the Earth*, by Egyptian author Taha Husayn. | 1949 Pakistan passes the Public Safety Act.<br>1949 Queen Juliana of the Netherlands transfers sovereignty to the federal Indonesian Government. Sukarno becomes the country's first president.<br>1949 Adoption of the Indian Constitution.<br>1949 Laos is granted autonomy within the French Union.<br>1949 Afghanistan refuses to recognize the Afghan-Pakistani border, the Durand Line.<br>1949 *I Saw in my Dream*, by New Zealand writer Frank Sargeson. |
| 1950 The Suppression Act passed in South Africa.<br>1950 The number of Portuguese settlers in Angola and Mozambique rises to 79,000 and 48,000 respectively.<br>1950 Expansion of the railway network in Mozambique. | 1950 European Convention on Human Rights.<br>1950 *The Bald Soprano*, by playwright Eugène Ionesco. | 1950 The Hashemite Kingdom of Jordan administers the West Bank. | 1950 *The Fugitive*, by Indonesian writer Pramoedya Ananta Toer.<br>1950 *The Story of My Life*, the autobiography of Indian writer U.V. Swaminatha Iyer. |
| 1951 *Kusadikika*, by Tanzanian author Shaaban Robert.<br>1951 Simon Kimbangu, the popular religious leader, dies in a prison in Belgian Congo.<br>1951 The National Party is formed in South Africa. | 1951 *Hadrian's Memoirs*, by French author Marguerite Yourcenar.<br>1951 Swedish writer Pär Lagerkvist awarded the Nobel Prize in Literature. | 1951 Libya becomes an independent monarchy.<br>1951 The nationalization of the Anglo-Iranian Oil Company results in the Abadan Crisis. | 1951 Premiere of *The Vagabond*, by Indian actor and director Raj Kapoor.<br>1951 Foundation of the Academy of Sciences of Tajikistan.<br>1951 The ANZUS Treaty: a defense agreement signed by Australia, New Zealand and the United States. |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| | 1947   *A Streetcar Named Desire*, by US playwright Tennessee Williams. | |
| | 1947   The 'Hollywood Ten' are blacklisted by the House Un-American Activities Committee for their alleged communist sympathies. Beginning of 'McCarthyism'. | |
| | 1947   Prominent US abstract expressionist Jackson Pollock develops 'action painting'. | |
| | 1947   *Under the Volcano*, by Canadian writer Malcolm Lowry. | |
| 1948   The establishment of separate North Korean (DPRK) and the Republic of Korea (ROK) governments with diametrically opposed political, economic and social systems. | 1948   Bertolt Brecht ends his exile in the USA after he is required to testify before the House Un-American Activities Committee. | 1948   Creation of the World Health Organization (WHO). |
| | 1948   Marshall Plan approved by Congress. | 1948   UN adopts the Convention on the Prevention and Punishment of the Crime of Genocide. |
| 1948   Completion of the serial novel *Sasameyuki* (*The Makioka Sisters*) by Japanese writer Junichiro Tanizaki. | 1948   Establishment of the Organization of American States (OAS). | 1948   UN General Assembly adopts the Universal Declaration of Human Rights. |
| 1948   *Snow Country*, by Japanese writer Yasunari Kawabata. | 1948   Civil war in Colombia. | |
| | 1948   Bardeen, Brattain and Schockley invent the transistor. | |
| 1949   Mao Zedong establishes the People's Republic of China. Chiang Kai-shek retreats to Taiwan and proclaims Tapei as the capital of the Republic of China. | 1949   William Faulkner awarded the Nobel Prize in Literature. | 1949   Creation of the North Atlantic Treaty Organization (NATO). |
| | 1949   *Death of Salesman*, by Arthur Miller. | 1949   Council of Mutual Economic Assistance (CMEA) created. |
| 1949   Plans for the Peace Park and Peace Center of Hiroshima presented by Japanese architect Kenzo Tange. | | 1949   UNESCO publishes the first editions of *Study Abroad* and *Index Translationum*. |
| 1949   Physicist Hideki Yukawa is the first Japanese to win the Nobel Prize. | | 1949   Creation of the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). |
| 1949   The Chinese Academy of Science is established. | | 1949   Foundation of the International Sociological Association. |
| 1950   Outbreak of the Korean War. | 1950   *Canto General*, by Chilean poet Pablo Neruda. | 1950   Creation of the Office of the UN High Commissioner for Refugees (UNHCR). |
| 1950   Release of *Rashomon*, by Japanese director Akira Kurosawa. | 1950   Retrospective of the works of Brazilian modernist artist Tarsila do Amaral in São Paulo. | |
| 1950   Nationalization of the Chinese film industry. | 1950   *The Old Man and the Sea*, by Ernest Hemingway. | |
| 1950   Battle of Chosin Reservoir (Korea). | 1950   *The Labyrinth of Solitude*, by Octavio Paz. | |
| | 1950   Introduction of artificial insemination for breeding livestock. | |
| 1951   By the Treaty of San Francisco, Japan renounces its claims to Taiwan. | 1951   Creation of the CNPq, the Brazilian national research institute. | |
| 1951   The US-Japanese Security Treaty. | 1951   *Catcher in the Rye*, by US writer J. D. Salinger. | |

| SUB-SAHARAN AFRICA *(Cont.)* | EUROPE *(Cont.)* | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* |
|---|---|---|---|
| | | | 1951 The first Indian Institute of Technology established in Kharagpur. |
| | | | 1951 *The Autobiography of an Unknown Indian*, by Nirad C. Chaudhuri. |
| 1952 *Palm-Wine Drinkard*, by Nigerian writer Amos Tutuola. | 1952 *Philosophical Investigations*, by Ludwig Wittgenstein. | 1952 Lebanon gives women the right to vote. | 1952 Construction of dams on the Helmand and Arghandao river valleys in Afghanistan. |
| | 1952 Construction of 'Unité d'Habitation' in Marseilles by architect Le Corbusier. | 1952 Release of the hit song *Itab* launches the career of Lebanese singer Fairouz. | 1952 The Language Movement establishes the rights of the Bengali community to speak their own language. |
| | 1952 Elizabeth II ascends to the British throne. | 1952 King Farouk is overthrown in a military coup led by Gamal Abdel Nasser. | |
| | 1952 Olympic Games in Helsinki. Soviet Union participates for the first time. | 1952 Beginning of massive migration of bedouins to urban areas in Saudi Arabia. | 1952 *A Time to Change*, by Indian poet Nissim Ezekiel. |
| | 1952 The European Coal and Steel Community (ECSC) Treaty enters into force. | 1952 Turkey joins NATO. | 1952 Swiss-born architect Le Corbusier begins designing a series of public buildings in Chandigarh, India. |
| | | 1952 Publication of the first volume of Mohammed Dib's trilogy *Algérie*. | 1952 *Dast-e-Saba*, by Pakistani poet Faiz Ahmed Faiz. |
| 1953 *L'Enfant noir*, by Guinea's Camara Laye. | 1953 Death of Stalin. Khrushchev becomes the Soviet Communist Party Secretary. | 1953 King Saud ascends to the Saudi throne upon the death of King Abdul Aziz. | 1953 Prince Daoud becomes prime minister of Afghanistan. |
| | 1953 *The Hive*, by Spanish writer Camilo José Cela. | 1953 Establishment of the Lebanese University. | 1953 Edmund Hillary of New Zealand and Tenzing Norgay of Nepal are the first to reach the summit of Mount Everest. |
| | 1953 The USSR tests hydrogen bomb. | 1953 *Statue de sel*, by Tunisian Jewish author Albert Memmi. | |
| | 1953 Crick and Watson discover the double helix structure of DNA. | 1953 Iranian Prime Minister Mossadegh is overthrown by Mohammad Reza Pahlavi. | 1953 France grants independence to Cambodia and Laos. |
| | 1953 *Waiting for Godot*, by Samuel Beckett. | 1953 Democratic elections held in independent Sudan. | |
| 1954 The Catholic University of Louvain (Belgium) establishes Louvanium (little Louvain) in Leopoldville (present-day Kinshasa). | 1954 *Juegos de Manos (Young Assassins)*, by Spanish writer Juan Goytisolo. | 1954 The Knesset passes legislation to encourage Israeli film production. | 1954 The Geneva Agreements establish the 17th parallel as a temporary dividing line between North and South Viet Nam and confirm the independence of Cambodia and Laos. |
| | 1954 *Lord of the Flies*, by William Golding. | 1954 *Al Ard (The Earth)*, by Egyptian writer Abdel Rahman al-Sharqawi. | |
| | 1954 Germany wins the World Cup held in Switzerland. | 1954 *Childhood of a Breast*, by Syrian poet Nizar Qabbani. | 1954 Creation of the Southeast Asia Treaty Organization (SEATO). |
| | 1954 The first purpose-built reactor for electrical power generation starts operating near Moscow. | 1954 Egypt is ruled by Nasser, promoter of Arab Socialism. | |
| | | 1954 *The Simple Past*, by Moroccan author Driss Chraïbi (the novel was banned in Morocco until 1977). | |
| | | 1954 National Liberation Front (FLN) launches the Algerian War of Independence. | |
| 1955 Amilcar Cabral founds the PAIGC (African Party for the Independence and Union of Guinea and Cape Verde). | 1955 The Federal Republic of Germany joins NATO. | 1955 *Mehmet, My Hawk*, by Turkish writer Yasar Kemal. | 1955 Afghanistan begins technical and military cooperation with the Soviet Union. |
| 1955 Armed struggle of the Nilot tribes in Sudan. | 1955 Withdrawal of Allied troops from Austria and creation of a neutral republic. | 1955 Deposed in 1953 by the French, Moroccan Sultan Mohammed V returns from exile. | 1955 The first nationwide election held in Indonesia. |
| 1955 Release of the film *Afrique sur le Seine*, by Paulin Soumanou Vieyra. | 1955 The Soviet Union and its Eastern European allies sign the Warsaw Pact in response to the formation of NATO. | | 1955 *Waiting for the Mahatma*, by Indian writer R. K. Narayan. |
| 1955 *Mauvais sang*, by Brazzaville poet Tchicaya U'Tamsi. | | | |
| | 1955 British Government passes the Children and Young Persons (Harmful Publications) Act. | | |
| | 1955 *Moromeţii*, by Romanian writer Marin Preda. | | |
| | 1955 First Documenta contemporary art exhibition in Kassel, Germany. | | |
| 1956 Nelson Mandela acquitted of treason in South Africa. | 1956 The world's first large-scale commercial reactor generating electrical power begins operation in Calder Hall, UK. | 1956 Nasser announces the nationalization of Franco-British Suez Canal, leading to the Suez War. | 1956 Pakistan becomes an Islamic republic with the adoption of a new constitution. |
| 1956 *Le Vieux Nègre et la Médaille* and *Le Pauvre Christ de Bomba*, by Cameroon authors Ferdinand Oyono and Mongo Beti, respectively. | 1956 Hungarian Revolution suppressed by Soviet troops. | 1956 Independence of Morocco and Tunisia. | 1956 Publication of the *History of Kirghizia*. |
| | | 1956 *Nedjma*, by Algerian author Jean Kateb Yacine. | 1956 The Summer Olympic Games are held in Melbourne (Australia). |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| 1952 Establishment of the Academy of Sciences in North Korea. | 1952 Death of 'Evita' Perón, immensely popular wife of President Perón.<br>1952 *The Invisible Man,* by African-American writer Ralph Ellison. | 1952 UNESCO adopts the Universal Copyright Convention. |
| 1953 The Korean armistice concluded.<br>1953 The Chinese government endorses 'Rules for Contraception and Abortion'. The beginning of strict measures to control population increase. | 1953 *The Lost Steps,* by Cuban writer Alejo Carpentier.<br>1953 Colour television made available in the USA.<br>1953 Execution of Julius and Ethel Rosenberg following controversial espionage trial.<br>1953 *The Adventures of Augie March,* by US writer Saul Bellow. | 1953 Dag Hammarskjold (Sweden) is appointed UN Secretary General. |
| 1954 The Chinese Character Reform Committee established.<br>1954 Foundation of the Institute of Sciences in South Korea.<br>1954 Release of legendary monster film *Godzilla,* by Ishiro Honda.<br>1954 Taiwan authorities establish the Science and Education Committee. | 1954 US President Eisenhower turns down France's request to use a nuclear weapon in Indochina.<br>1954 Transistor radios are commercialized in the USA.<br>1954 Ernest Hemingway awarded the Nobel Prize in Literature.<br>1954 Death of Frida Kahlo, Mexican artist and feminist cult figure. | 1954 Creation of the Latin Union.<br>1954 UNESCO adopts the Convention on the Protection of Cultural Property in the Event of Armed Conflict (The Hague Convention). |
| 1955 The first Gutai exhibition held in Tokyo. | 1955 Jonas Salk develops polio vaccine.<br>1955 Owen Chamberlain produces and identifies the antiproton.<br>1955 *Lolita,* by Vladimir Nabokov.<br>1955 Argentine President Perón forced into exile.<br>1955 *Compère Général Soleil,* by Haitian writer Jacques-Stephen Alexis.<br>1955 *Pedro Páramo,* by Juan Rulfo. | 1955 Birth of the Non-Aligned Movement (NAM) at the Bandung Conference in Indonesia.<br>1955 Creation of the Warsaw Pact. |
| 1956 *The Temple of the Golden Pavilion,* by Japanese writer Yukio Mishima.<br>1956 'The March Towards Science and Technology' announced in China. | 1956 *Howl,* by US Beat poet Allen Ginsberg.<br>1956 *A Long Day's Journey into Night,* by Eugene O'Neill. | 1956 United Nations Supplementary Convention on the Abolition of Slavery, the Slave Trade and Institutions and Practices Similar to Slavery. |

| SUB-SAHARAN AFRICA (Cont.) | EUROPE (Cont.) | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB (Cont.) | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA (Cont.) |
|---|---|---|---|
| 1956 Liberals establish the University of Elizabethville (Lubumbashi) in the Congo. | 1956 Russian specialist in chemical kinetics, Nikolay Semenov, is awarded the Nobel Prize in Chemistry. | 1956 Tel-Aviv University is founded. | 1956 *Train to Pakistan*, by Indian writer Khushwant Singh. |
| 1956 The Popular Movement for the Liberation of Angola (MPLA) is founded in Luanda. | 1956 *The Visit*, by Swiss writer Friedrich Dürrenmatt. | 1956 The USA and England refuse to finance the construction of the Aswan High Dam in Egypt. | |
| 1956 Sudan achieves independence. | 1956 Spanish poet Juan Ramón Jiménez awarded Nobel Prize in Literature. | | |
| | 1956 *Historias do Zaire*, by Portuguese writer Alexandre Cabral. | | |
| 1957 Creation of African Nations Cup (CAN) soccer tournament. | 1957 *Doctor Zhivago*, by Boris Pasternak, published in the West. | 1957 Oil discovered in Libya. | 1957 *Voss*, by Australian writer Patrick White. |
| 1957 Establishment of Dakar University. | 1957 Treaty of Rome creates the European Economic Community (EEC) and EURATOM. | 1957 The Jordanian Cinema film production company produces its first film, *Struggle in Jarash*. | 1957 *The God Boy*, by New Zealand writer Ian Cross. |
| 1957 Creation of MAC (Anti-Colonialist Movement) in several Portuguese colonies. | 1957 First artificial satellite, *Sputnik I*, launched by the USSR. | 1957 Beginning of 30-year rule of President Habib Bourguiba, promoter of secularism and women's rights in Tunisia. | 1957 The Federation of Malaya (Malaysia) achieves independence. |
| 1957 Ghana becomes the first independent state in sub-Saharan Africa. | 1957 French writer Albert Camus awarded Nobel Prize in Literature. | 1957 Foreign troops leave the occupied territory of the Suez Canal. | |
| 1957 UNESCO initiates a public library development project in Enugu, Nigeria. | 1957 *Grey and Green Painting*, by Spanish artist Antoni Tàpies. | 1957 King Hussein declares martial law in Jordan. | |
| 1957 Ghanan writer Kofi Awoonor begins translating African oral traditions into English. | 1957 Publication of first volume of *Journal*, by Polish writer Witold Gombrowicz. | 1957 Publication of the 'Cairo Trilogy' by Egyptian writer Naguib Mahfouz. | |
| | 1957 *The Baron in the Trees*, by Italian writer Italo Calvino. | | |
| | 1957 *The Seventh Seal*, by Swedish director Ingmar Bergman. | | |
| 1958 Formation of the Mouvement National Congolais. | 1958 General de Gaulle recalled to form a government in France. | 1958 Egypt and Syria merge to form the United Arab Republic. | 1958 The Indian Government announces the Scientific Policy Resolution. |
| 1958 Resolution on Imperialism and Colonialism adopted at the All-African People's Conference in Accra. | 1958 *Structural Anthropology*, by French anthropologist Claude Lévi-Strauss. | | |
| 1958 *Things Fall Apart*, by Nigerian writer Chinua Achebe. | 1958 *Sputnik 3* is launched by the USSR. | | |
| 1958 Robert Sobukwe founds the Pan-Africanist Congress in South Africa. | 1958 'Le Vide' exhibit (an empty gallery painted white) by French conceptual artist Yves Klein. | | |
| | 1958 Boris Pasternak awarded the Nobel Prize in Literature. | | |
| | 1958 *If This Is a Man*, autobiography of Italian writer Primo Levi. | | |
| | 1958 Beginning of the French 'New Wave' film movement championed by directors Truffaut, Godard and Chabrol. | | |
| 1959 Port workers strike in Bissau organized by the PAIGC (African Party for the Independence and Union of Guinea and Cape Verde). | 1959 The Obscene Publications Act passed in the UK. | 1959 The Palestine student union is founded in Egypt. | 1959 *The World of Apu*, by Indian director Satyajit Ray. |
| 1959 The Bissau Massacre. | 1959 Creation of the European Court of Human Rights. | 1959 Creation of Lebanese Public Television. | 1959 King Mahendra of Nepal issues a new constitution and holds the first democratic elections for the national assembly. |
| 1959 Adoption of the Billion Bantustans (reservations) in South Africa. | 1959 Soviet probes *Luna* 1, 2 and 3. | 1959 The Jordanian Broadcasting station begins operation in Amman. | 1959 A new constitution declares Brunei a self-governing state. |
| 1959 Completion of the Kariba hydroelectric dam project on the Zambezi River in Zimbabwe. | 1959 The West German Technical Information Library (TIB) opens in Hanover. | | 1959 The Indonesian president, Sukarno, imposes an authoritarian regime under the label of 'Guided Democracy'. |
| 1959 Bloody conflict between Tutsi and Hutu ethnic groups in Rwanda. | 1959 *The Tin Drum*, by German writer Günter Grass. | | 1959 Lee Kuan Yew becomes the first prime minister of Singapore. |
| 1959 Foundation of the Museums Association of Tropical Africa (AMAT-MATA). | | | |
| 1960 Seventeen African countries gain independence. By the mid-decade most African countries are independent. | 1960 *La Dolce Vita*, by Italian director Federico Fellini. | 1960 Creation of the Organization of the Petroleum Exporting Countries (OPEC) in Baghdad. | 1960 The Sino-Afghan Friendship Treaty. |
| | | | 1960 *A Good Keen Man*, by New Zealand writer Barry Crump. |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| | 1956 Nobel Prize for Physics awarded to John Bardeen, Walter Brattain and William Shockley for their research on the transistor. | |
| 1957 Mao Zedong's 'One Hundred Flowers' campaign.<br>1957 *New Theory on Population*, by the President of Beijing University, Ma Yinchu.<br>1957 Japanese physicist Leo Esaki creates the first tunnel diodes. | 1957 *On the Road*, by US writer Jack Kerouac.<br>1957 Noam Chomsky introduces the concept of generative grammar in his book *Syntactic Structures*.<br>1957 The first Ampex recorder. | 1957 Creation of the International Atomic Energy Agency. |
| 1958 *The Teahouse*, by Chinese writer Lao She.<br>1958 Mao Zedong announces the 'Great Leap Forward' aimed at rapidly raising industrial and agricultural production.<br>1958 Chinese government decides to popularize Mandarin Chinese based on a Beijing dialect.<br>1958 The Tokyo Tower is completed. | 1958 *La Lézarde*, by Martiniquan writer Jean-Claude Carrière ('Benoit Becker').<br>1958 National Council for Scientific Research founded in Argentina.<br>1958 Creation of National Aeronautics and Space Administration (NASA), and inauguration of the Mercury Project.<br>1958 *Explorer I*, the first US satellite in orbit.<br>1958 *Vanguard I* satellite is launched into orbit.<br>1958 New York's MoMA organizes the 'New American Painting' travelling exhibition to showcase the new generation of abstract expressionist artists.<br>1958 World Cup won by Brazil.<br>1958 Jack St. Clair Kilby invents the integrated circuit.<br>1958 First use of solar cells on an orbiting satellite. | |
| 1959 Taiwanese authorities establish the Long-Term Science Development Committee.<br>1959 The Atomic Energy Institute established in South Korea.<br>1959 The Dalai Lama flees to India. | 1959 Cuban Revolution led by Castro.<br>1959 Inauguration of the Guggenheim Museum (New York) by architect Frank Lloyd Wright.<br>1959 *Pioneer* 4 passes within 37,000 miles of the Moon.<br>1959 Writer Carl Sandburg prevented by US authorities from going to Russia.<br>1959 *The Double Hook*, by Canadian writer Sheila Watson.<br>1959 First generation of mainframe computers. | 1959 The Second Vatican Council convened by Pope John XXIII.<br>1959 UN Declaration on the Rights of the Child.<br>1959 Antarctic Treaty. |
| 1960 *After the Banquet*, by Japanese writer Yukio Mishima. | 1960 Henry Miller publishes *Nexus*, the last book in the *The Rosy Crucifixion*. | |

| SUB-SAHARAN AFRICA *(Cont.)* | EUROPE *(Cont.)* | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* |
|---|---|---|---|
| 1960 Britain relinquishes Somaliland, which merges with Italian Somalia. | | 1960 Discovery of oil in the United Arab Emirates. | |
| 1960 Senegalese historian Djibril Tamsir Niane publishes *Sundiata: An Epic of Old Mali.* | | 1960 The first National School of Fine Arts, the State Institute of Decorative Arts and the Higher School of Television and Cinema are founded in Iran. | |
| 1960 *Les Bouts de bois de Dieu*, by Senegalese writer and filmmaker Sembene Ousmane. | | 1960 Construction of the Aswan High Dam begins. UNESCO launches an international campaign to save the Nubian monuments from the rising waters of the Nile. | |
| 1960 The number of Portuguese settlers in Angola and Mozambique rises to 172,500 and 97,000 respectively. | | 1960 PAIGC activists are trained in Algeria. | |
| 1960 Establishment of Tananarive University (Madagascar). | | | |
| 1960 South Africa takes measures to reduce its dependence on foreign oil. | | | |
| 1960 Peak of the anti-colonial movement in the Portuguese colonies. | | | |
| 1960 Small nationalist parties exiled in Tanganyika and Rhodesia strive to achieve independence in Mozambique. | | | |
| 1960 Mass protests in northern Mozambique culminate in the Mueda massacre in Cabo Delgado. | | | |
| 1960 Popular demonstrations in support of the ideals promoted by activist writer Agostinho Neto in Angola. | | | |
| 1960 Statesman and poet Léopold Senghor becomes President of Senegal. | | | |
| 1960 Sharpeville massacre in South Africa. | | | |
| 1960 Robert Sobukwe, the founder of Pan-Africanist Congress, puts forward the concept of 'Black Consciousness'. | | | |
| 1960 Chad and Mauritania, Belgian Congo and Somalia achieve full independence. | | | |
| 1960 Debates on the resolution: 'Freedom and independence for all colonial peoples'. | | | |
| 1960 *African*, by William Conton from Sierra Leone. | | | |
| 1960 Patrice Lumumba, first prime minister of the independent Republic of Congo, is overthrown in a coup d'état and subsequently assassinated. | | | |
| 1961 Sierra Leone and Tanganyika (mainland Tanzania) achieve independence. | 1961 Construction of the Berlin Wall. | 1961 Syria secedes from the United Arab Republic. | 1961 The United States sends military advisers to South Viet Nam. |
| 1961 *Nocturnes*, by Léopold Senghor. | 1961 Imprisonment of Nobel Prize winning philosopher Bertrand Russell for anti-nuclear protest. | 1961 Kuwait achieves independence. | 1961 India invades and annexes the Portuguese colony of Goa. |
| 1961 The first conference of Nationalist Organizations of Portuguese Colonies (CONCOP) is held in Algiers, with the objective to wage war against Portuguese occupation. | 1961 UK, Denmark and Ireland apply for EEC membership. | 1961 *Songs of Mihyar the Damascene*, by Syrian-Lebanese poet Adonis (Ahmad Esper). | 1961 *Corruption*, by Indonesian writer Pramoedya Ananta Toer. |
| 1961 Open war is launched against colonialism in Angola. | 1961 Soviet cosmonaut Yuri A. Gagarin aboard *Vostok I* is the first man to orbit Earth. | 1961 Kurd uprising in north-east Iraq. | 1961 *Sunlight on a Broken Column*, by Indian writer Attia Hosain. |
| | 1961 The link between thalidomide and limb malformations in infants confirmed. | 1961 Hassan II becomes King of Morocco. | 1962 Australian Aborigines are given the right to vote. |
| | 1961 Bosnian writer Ivo Andrič awarded Nobel Prize in Literature. | 1961 MPLA troops are trained in Algeria. | |
| | 1961 *Andorra*, by Swiss writer Max Frisch. | | |
| 1962 Beginning of Nelson Mandela's three-decade imprisonment in South Africa. | 1962 *Philosophical Faith and Revolution*, by Karl Jaspers. | 1962 *Fire and Trees*, by Israeli writer Samuel Joseph Agnon. | 1962 A military coup led by General Ne Win ends democratic rule in the Union of Burma. |
| | 1962 EEC institutes the Common Agricultural Policy (CAP). | | |

| **EAST ASIA** *(Cont.)* | | **THE AMERICAS** *(Cont.)* | | **INTERNATIONAL EVENTS** *(Cont.)* | |
|---|---|---|---|---|---|
| 1960 | The Treaty of Mutual Cooperation and Security, which allows the USA to maintain a military presence in Japan, gives rise to violent protests in Japan. | 1960 | US President Kennedy proposes 'Alliance for Progress' in Latin America. | | |
| 1960 | The Sino-Soviet split. | 1960 | US President Eisenhower reduces Cuba's support quota of sugar. | | |
| | | 1960 | *Tiros 1*, the first successful weather satellite, is launched by NASA. | | |
| | | 1960 | Launching of *Discoverer 14*, the first successful US camera-equipped spy satellite. | | |
| | | 1960 | Creation of Latin American Free Trade Association (LAFTA). | | |
| | | 1960 | The United States Library of Congress creates MARC (Machine Readable Cataloging) format. | | |
| | | 1960 | US Department of Defense designs the Internet for internal use. | | |
| | | 1960 | Literacy campaign in Cuba. | | |
| | | 1960 | Inauguration of Brazil's new capital, Brasília, designed by urbanist Lúcio Costta and architect Oscar Niemeyer. | | |
| | | 1960 | Beginning of the 'Quiet Revolution' in Quebec. | | |
| 1961 | First performance of *Hai Rui Dismissed from Office*, by Chinese historian and playwright Wu Han. | 1961 | The USA breaks off diplomatic relations with Cuba and imposes a diplomatic and economic blockade on the island. | 1961 | Creation of Amnesty International. |
| | | 1961 | Bay of Pigs Invasion. Anti-Castro Cuban exiles aided by the US Government organize an unsuccessful invasion of Cuba. | 1961 | Single Convention on Narcotic Drugs. |
| | | | | 1961 | U Thant (Burma) is appointed UN Secretary General. |
| | | | | 1961 | Creation of the World Wildlife Fund. |
| | | | | 1961 | Creation of the Organisation for Economic Co-operation and Development (OECD). |
| | | | | 1961 | First Conference of Non-Alignment Movement (NAM) in Belgrade. |
| 1962 | *The Woman in the Dunes*, by Japanese writer Kobo Abe. | 1962 | *Silent Spring*, by Rachel Carson. | | |
| | | 1962 | *In a Green Night*, by Caribbean poet Derek Walcott. | | |

| SUB-SAHARAN AFRICA (Cont.) | EUROPE (Cont.) | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB (Cont.) | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA (Cont.) |
|---|---|---|---|
| 1962 Rwanda and Uganda achieve independence. | 1962 *The Savage Mind*, by Claude Lévi-Strauss.<br>1962 *One Day in the Life of Ivan Denisovich*, by Russian writer Alexandr Solzhenitsyn. | 1962 The Shah of Iran launches an unsuccessful reform package known as the White Revolution.<br>1962 The first university in the Kingdom of Jordan.<br>1962 Tripoli Programme of the National Liberation Front (NCF), Algeria.<br>1962 FLN (National Liberation Front) adopts the Tripoli Programme as their party platform. French President De Gaulle signs the Evian Agreements; France recognizes Algeria's independence. Ben Bella becomes president.<br>1962 Revolutionary forces supported by Egypt take control of Sana'a and create the Yemen Arab Republic. | 1962 King Mahendra of Nepal promulgates a new constitution enshrining the absolute power of the monarchy.<br>1962 Border disputes lead to the Sino-Indian War. |
| 1963 The Publications and Ententainments Acts is passed in South Africa.<br>1963 Zanzibar and Kenya achieve independence.<br>1963 War against colonialism erupts in Guinea-Bissau and Cape Verde.<br>1963 Creation of the Organization of African Unity (OAU) in Addis Ababa.<br>1963 UNESCO-supported regional library and information education programmes are initiated in Senegal and Uganda. | 1963 Soviet cosmonaut Valentina Tereshkova is the first women in space.<br>1963 Greek writer Giorgos Seferis awarded the Nobel Prize in Literature.<br>1963 *The Ice Palace*, by Norwegian writer Tarjei Vesaas. | 1963 *Des Hommes sous le Soleil*, by Palestinian writer Ghassan Kanafanî.<br>1963 Creation of TUBITAK, Turkey's scientific research foundation.<br>1963 Publication of *Islam and the Problems of Civilization*, by Egyptian intellectual Sayyid Qutub.<br>1963 The Palestinian Workers General Union is established in Gaza.<br>1963 Creation of the Palestine Studies Foundation.<br>1963 FRELIMO troops are trained in Algeria. | 1963 The Federation of Malaya, Singapore, North Borneo and Sarawak are merged to form Malaysia.<br>1963 The Official Language Act makes English an associate official language in India.<br>1963 *Coal Flat*, by New Zealand writer Bill Pearson. |
| 1964 Creation of Nyasaland and Zambia.<br>1964 Julius Nyerere becomes President of Tanzania, created out the union between Zanzibar and Tanganyika.<br>1964 On trial for sabotage, Nelson Mandela delivers his moving 'Speech from the Dock' and is sentenced to life imprisonment.<br>1964 Zambia and Malawi achieve independence.<br>1964 Opening of the University of Abidjan.<br>1964 War against colonialism spreads to Mozambique. | 1964 Lenoid Brezhnev succeeds Krushchev as First Secretary of the Communist Party in USSR.<br>1964 A. Prokhorov and N. Basov awarded the Nobel Prize in Physics for the development of masers.<br>1964 Russian Poet Joseph Brodsky arrested for 'social parasitism'.<br>1964 French psychoanalyst Jacques Lacan establishes the École Freudienne de Paris. | 1964 Completion of the National Water Carrier in Israel ensures large-scale irrigation and power production.<br>1964 Beginning of the reign of King Faisal in Saudi Arabia.<br>1964 Ministry of Arts and Culture is established in Iran.<br>1964 The First Congress of the NLF, Algeria.<br>1964 The Second NAM Conference takes place in Cairo, Egypt.<br>1964 The Palestine Liberation Organization (PLO) is established.<br>1964 Iran, Turkey and Pakistan form the Regional Cooperation for Development. | 1964 Opening of the Salang Tunnel linking Afghanistan's northern and southern regions.<br>1964 Ratification of a new Afghan Constitution. |
| 1965 First Pan-African Games held in Brazzaville, Congo. | 1965 Soviet cosmonaut Alexei A. Leonov makes the first space walk, from *Voskhod 2*.<br>1965 The legendary rock-pop group the Beatles are awarded the Order of the British Empire by Queen Elizabeth II.<br>1965 *How To Explain Pictures to a Dead Hare*, performance art by German artist Joseph Beuys. | 1965 Inauguration of the Israel Museum in Jerusalem.<br>1965 Colonel Houari Boumediene overthrows Algerian President Ben Bella. | 1965 Singapore secedes from Malaysia.<br>1965 Afghan women are given the right to vote.<br>1965 *Dast-e-Tah-e-Sang*, by Pakistani poet Faiz Ahmed Faiz.<br>1965 The second Indo-Pakistani War.<br>1965 *Wild Cat Falling*, by Australian writer Colin Johnson.<br>1965 *Memoirs of a Peon*, by New Zealand writer Frank Sargeson.<br>1965 Ferdinand Marcos is elected president of the Philippines. |
| 1966 First World Black and African Festival of Arts and Culture takes place in Dakar. | 1966 *The Order of Things (Les mots et les choses)*, by French philosopher Michel Foucault. | 1966 Israeli writer Samuel Joseph Agnon is awarded the Nobel Prize in Literature. | 1966 The Tashkent Declaration, a peace agreement between India and Pakistan. |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| | 1962 Pop artist Andy Warhol exhibits Campbell Soup pictures. | |
| | 1962 *Friendship 7*, manned by US astronaut John H. Glenn Jr., orbits the Earth three times. | |
| | 1962 *Mariner 2* approaches Venus. | |
| | 1962 Brazilian musician Antonio Carlos Jobim composes *The Girl from Ipanema*, the song that popularizes bossa nova music internationally. | |
| | 1962 World Cup takes place in Chile. Brazil wins the championship. | |
| | 1962 *The Death of Artemio Cruz*, by Mexican author Carlos Fuentes. | |
| | 1962 Death of Hollywood icon Marilyn Monroe. | |
| | 1962 Cuban Missile Crisis. | |
| 1963 *Sacrifice*, by Japanese painter Kazuo Shiraga. | 1963 Songwriter-musician Bob Dylan releases *Blowin' in the Wind*, popular protest song. | 1963 UNESCO publishes the first edition of *The Statistical Yearbook*. |
| 1963 *Astro Boy*, the animated series by Osamu Tezuka, is first broadcast on Japanese television. | 1963 *The Feminine Mystique*, by Betty Friedan. | 1963 Partial Test Ban Treaty. |
| | 1963 Martin Luther King delivers his 'I Have a Dream' oration in Washington DC. | 1963 UN creates the World Food Programme (WFP). |
| | 1963 Assassination of US President J. F. Kennedy in Dallas, Texas. | |
| | 1963 *Rayuela (Hopscotch)*, by Argentine writer Julio Cortázar. | |
| 1964 China detonates its first atomic bomb. | 1964 National Museum of Anthropology inaugurated in Mexico City. | 1964 Group of 77 established at the first UN Conference on Trade and Development (UNCTAD). |
| 1964 Establishment of the Social Academy of Science in the Democratic People's Republic of Korea. | 1964 US *Ranger 7* relays the first close-range photographs of the Moon. | |
| 1964 The first Olympics Games in Asia held in Tokyo. | US President Lyndon Johnson signs the Civil Rights Act. | |
| 1964 The Tokaido Shinkansen, the world's first inter-city, high-speed railway system, begins operations between Tokyo and Osaka. | 1964 BASIC programming language developed. | |
| 1964 Chinese scientists artificially synthesize bovine insulin. | 1964 US artist Robert Rauschenberg is awarded the grand prize at the 1964 Venice Biennale. | |
| 1964 China adopts the simplified Chinese character system to promote literacy. | 1964 US Supreme Court rules that *Tropic of Cancer* (1934) by Henry Miller is not obscene. | |
| 1964 The Taiwan Academia Sinica establishes centres of mathematics, physics, chemistry, biology and engineering science. | 1964 Military coup in Brazil. | |
| | 1964 *Herzog*, by Saul Bellow. | |
| | 1964 First communication satellite launched by the USA. | |
| | 1964 Arno Penzias and Robert W. Wilson discover cosmic microwave background radiation. | |
| | 1965 First manned flight of the US Gemini Project, *Gemini 3*. | 1965 UN adopts the International Convention on the Elimination of All Forms of Racial Discrimination. |
| | 1965 US *Mariner 4* transmits the first close-range images of Mars. | 1965 United Nations Children's Fund (UNICEF) is awarded the Nobel Peace Prize. |
| | 1965 Prior censorship of a film is found unconstitutional by US courts. | |
| | 1965 *A Season in the Life of Emmanuel*, by Canadian writer Marie-Claire Blais. | |
| 1966 The Great Proletarian Cultural Revolution launched in China. | 1966 The International Society for Krishna Consciousness founded in New York. | 1966 UN adopts the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights. |
| | | 1966 Creation of the United Nations Development Programme (UNDP). |

| SUB-SAHARAN AFRICA (Cont.) | EUROPE (Cont.) | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB (Cont.) | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA (Cont.) |
|---|---|---|---|
| 1966 Gulf Oil begins extraction of crude oil in Cabinda, Angola. | 1966 Soviet *Luna 9* makes the first Soviet soft-landing on the Moon. *Luna 10* is the first spacecraft to orbit the Moon. | 1966 The Department of Culture and Fine Arts established in Jordan. | 1966 Nehru's daughter, Indira Gandhi, is the first woman to become prime minister of India. |
| 1966 *Efuru*, by Nigerian Flora Nwapa, one of the emerging African women writers. | | 1966 Inauguration of Iraq's national museum in Baghdad. | |
| 1966 An investment of US$100 million is authorized for gold mining in Cassinga, Angola. | | | |
| 1966 Julius Nyerere translates Shakespeare's *Julius Caesar* into Swahili. | | | |
| 1966 President Kwame Nkrumah, proponent of Pan-Africanism, is overthrown in a military coup in Ghana. | | | |
| 1966 Establishment of the Central African Customs and Economic Union (UDEAC). | | | |
| 1967 Outbreak of the Nigerian Civil War. | 1967 Arte Povera movement in Italy. | 1967 The Six-Day War: Israel launches preventive war on Egypt, Syria and Jordan. | 1967 Army general Suharto becomes president of Indonesia. |
| 1967 *A Grain of Wheat*, by Kenyan author Ngugi wa Thiong'o. | 1967 *Of Grammatology*, by French philosopher Jacques Derrida. | 1967 Palestine falls under Israeli occupation. | 1967 500,000 American troops are stationed in Viet Nam. |
| 1967 The Igbo declare the independence of Biafra from Nigeria. | 1967 The EEC, ECSC and EURATOM merge to form the European Community. | 1967 Ban on importation and circulations of books in Palestine under Israeli occupation. | 1967 Australian Aborigines obtain the privileges of citizenship. |
| 1967 After seizing power in a coup d'état, Gnassingbé Eyadéma's becomes President of Togo. | 1967 *Venera 4* ejects capsules, returns data about the atmosphere of Venus. | 1967 Arab troops are defeated in the war with Israel. | 1967 Establishment of the ASEAN Regional Forum. |
| 1967 Foundation of the East African community. | 1967 Pulsars or neutron stars observed by English astronomer Jocelyn Bell. | 1967 *Les Alouettes naïves*, by Algerian writer Assia Djebar. | |
| | | 1967 UN Security Council passes Resolution 242 calling for the withdrawal of Israeli forces from occupied territories. | |
| 1968 *Soleil des indépendances*, by Ahmadou Kourouma of Côte d'Ivoire. | 1968 Warsaw Pact countries invade Czechoslovakia to crush the liberal reforms of the Prague Spring. | 1968 First documentaries on Palestinian issues. | 1968 North Viet Nam launches the Tet offensive, marking a turning point in the Viet Nam War. |
| 1968 *The Beautiful Ones Are Not Yet Born*, by Ayi Kwei Armah. | 1968 Attempt to democratize Poland, persecution of Polish intellectuals. | 1968 Completion of the project to safeguard the temples of Abu Simbel in Nubia. | |
| 1968 *Le Devoir de violence*, by Malian writer Yambo Ouologuem. | 1968 Soviet *Zond 5* is first spacecraft to orbit the Moon and return to Earth. | 1968 *My Michael*, by Israeli writer Amos Oz. | |
| 1968 Ngugi wa Thiong'o and other African writers call for replacing the English Department at the University of Nairobi by a Department for African Language and Literature. | 1968 May 1968 student revolt in France. | 1968 Creation of Jordanian Television (JTV). | |
| 1968 The South African Student Organisation is founded. | | | |
| 1969 First Pan-African film festival (FESPACO) in Ouagadougou. | 1969 Persecutions of intellectuals in Czechoslovakia. | 1969 *L'Oeil et la nuit*, by Abdellatif Laâbi. | 1969 *Joy of the Worm*, by New Zealand writer Frank Sargeson. |
| | 1969 Inauguration of Art Basel, international contemporary art fair. | 1969 Australian Michael Dennis Rohan sets the Al-Aqsa mosque on fire. | 1969 *Storm in Chandigarh*, by Indian writer Nayantara Sahgal. |
| | 1969 *Soyuz 4* and 5 perform the first Soviet spaceship docking. | 1969 The Organization of the Islamic Conference (OIC) established in Rabat, Morocco. | |
| | 1969 Samuel Beckett awarded the Nobel Prize in Literature. | 1969 *Le Scorpion*, by Albert Memmi. | |
| | | 1969 *The Land*, by Egyptian filmmaker Youssef Chahine. | |
| | | 1969 King Idris of Libya is overthrown by Colonel Gaddafi. | |
| | | 1969 Yasser Arafat takes control of the PLO. | |
| | | 1969 General Jafar Numayri leads a military coup in Sudan. | |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| 1966 Publication of *Quotations from Chairman Mao Zedong*, known as 'The Little Red Book'. | 1966 *Surveyor 1*, the first US spacecraft to soft-land on the Moon.<br><br>1966 US *Lunar Orbiter 1* enters the Moon's orbit, and takes the first picture of the Earth from the Moon.<br><br>1966 Creation of the National Organization for Women (NOW).<br><br>1966 The US Freedom of Information Act passed. | |
| 1967 China tests its first hydrogen bomb.<br><br>1967 *The Silent Cry*, by Japanese writer Kenzaburo Oe.<br><br>1967 The Science Promotion Committee established in Taiwan. | 1967 Charismatic revival in the US.<br><br>1967 Guatamalan writer Miguel Angel Asturias is awarded the Nobel Prize in Literature.<br><br>1967 Electroweak theory proposed by Glashow, Weinberg and Salaam.<br><br>1967 Marxist revolutionary leader Che Guevara is killed by the Bolivian army.<br><br>1967 Montreal Expo '67.<br><br>1967 *Le Nez qui Voque*, by French-Canadian writer Réjean Ducharme.<br><br>1967 'Summer of Love' in San Francisco.<br><br>1967 *One Hundred Years of Solitude*, by Colombian writer Gabriel Garcia Márquez. | 1967 First International Literacy Day celebrated on 8 September. |
| 1968 Completion of Japan's first high-rise building, the Kasumigaseki Building.<br><br>1968 Founding of the Science and Technology Research Institute in South Korea.<br><br>1968 Yasunari Kawabata is the first Japanese, and second Asian, to be awarded the Nobel Prize in Literature. | 1968 The Latin American Episcopal Council of Medellín (Columbia) denounces 'institutional violence' and advocates 'the preferentials option for the poor'.<br><br>1968 Launching of *Apollo 7*, the first manned Apollo mission.<br><br>1968 Assassination of Martin Luther King.<br><br>1968 Military coup in Peru led by General Alvarado.<br><br>1968 Olympic Games are held in Mexico City. Student demonstrators are repressed in Tlatelolco massacre.<br><br>1968 *2001: A Space Odyssey*, by director Stanley Kubrick.<br><br>1968 *Lost in the Funhouse*, by US writer John Barth. | 1968 Nuclear Non-Proliferation Treaty is signed by the USSR, USA and UK. |
| 1969 *The Dark Room*, by Japanese writer Junnosuke Yoshiyuki.<br><br>1969 Radical student movements across Japan.<br><br>1969 Opening of the first Beijing underground public transport system. | 1969 *Apollo 11* astronauts Neil Armstrong and Edwin Aldrin, Jr. make the first Moon walk.<br><br>1969 *Mariner 6* transmits high-resolution images of Mars.<br><br>1969 Stonewall riots in New York City mark a turning point in the gay rights movement. Creation of the Gay Liberation Front.<br><br>1969 Woodstock (New York) music festival becomes a symbol of the hippie generation.<br><br>1969 'The football war' between Salvador and Honduras lasts four days.<br><br>1969 The Cartagena Agreement creates the Andean Community (CAN).<br><br>1969 *Conversation in the Cathedral*, by Peruvian writer Mario Vargas Llosa. | 1969 Adoption of the Vienna Convention on the Law of Treaties.<br><br>1969 International Labour Organization (ILO) is awarded the Nobel Peace Prize. |

| SUB-SAHARAN AFRICA *(Cont.)* | EUROPE *(Cont.)* | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* |
|---|---|---|---|
| 1970 Portuguese settlers in Angola and Mozambique number 290,000 and 150,000 respectively. | 1970 A. Solzhenitsyn awarded the Nobel Prize in Literature. | 1970 The rise in Iranian Shi'ism. | |
| 1970 A series of famines in Ethiopia. | 1970 Soviet *Luna 16* returns from the Moon with rock samples; *Luna 17* lands on the Moon with the first automatic robot. | 1970 'Black September': Jordanian troops attack Palestinians in refugee camps. The PLO is expelled from Amman and moves to Beirut. | |
| 1970 After three years of civil war, Biafra surrenders and is reincorporated into Nigeria. | 1970 Soviet probe *Venera 7* makes the first successful landing on Venus. | 1970 Hafiz al-Assad becomes President of Syria. Anwar Sadat becomes President of Egypt following Nasser's death. | |
| 1970 *No Sweetness Here*, by Ama Ata Aidoo, Ghanian author who explores women-related issues in modern Africa. | 1970 Soviet Union establishes International System of Scientific and Technical Information (MSNTI). | | |
| 1970 Many African countries establish science and technology policy organizations. | | | |
| 1970 Escalation of armed conflict in the Portuguese colonies during the struggle for political independence. | | | |
| 1971 Military strongman Idi Amin seizes power in Uganda. | 1971 USSR launches *Salyut 1* space station. | 1971 Qatar achieves independence. | 1971 The Pakistan army carries out massive killings of Bengali civilians. Over 10 million Bengalis flee to neighboring India. |
| | 1971 Germany passes the world's first data protection law. | 1971 United Arab Emirates is formed by the federation of seven sheikhdoms. | 1971 The third Indo-Pakistani War. The Pakistan army surrenders and the new nation of Bangladesh is created. |
| | 1971 Open University founded in the UK. | 1971 Algerian President Boumediene launches agrarian reform and nationalizes the oil industry. | 1971 The Indo-Soviet Friendship Treaty. |
| | | 1971 The Palestinian Women's General Union. | 1971 Establishment of the South Pacific Forum. |
| | | | 1971 *Bye-Bye Blackbird*, by Indian writer Anita Desai. |
| 1972 Publication of the collection of poems entitled *Beware, Soul Brother*, by Nigerian writer Chinua Achebe. | 1972 Palestinian terrorists massacre 12 Israeli athletes at the Olympic Games in Munich. | 1972 The Palestinian Teachers' Association is inaugurated in Damascus. | 1972 UNESCO undertakes a campaign to restore the Temple of Borobudur (Indonesia). |
| 1972 Genocide resulting from ethnic strife in Burundi. | 1972 Russian poet Joseph Brodsky emigrates to the USA. | 1972 The Research and Documentation Centre at al-Najah National University, Palestine. | 1972 Establishment of the Indian Department of Space. |
| | 1972 Heinrich Böll awarded Nobel Prize in Literature. | | 1972 President Marcos declares martial law in the Philippines. |
| | | | 1972 Ceylon's name is changed to Sri Lanka and country adopts a new republican constitution. |
| 1973 Steve Biko banned for black activism in South Africa. | 1973 Denmark, Ireland and the United Kingdom join the European Communities. | 1973 A National Council elected in Bahrain to democratize the country (aborted in 1975). | 1973 Former Prime Minister Mohammad Daoud overthrows the constitutional monarchy in Afghanistan. |
| | 1973 Creation of the European Space Agency (ESA). | 1973 Taha Husayn recieves the United Nations' Human Rights Award. | 1973 Opening of the Sydney Opera House. |
| | | 1973 Yom Kippur War. | 1973 The creation of the National Film Awards sponsored by the Indian Government. |
| | | 1973 Oil crisis results from OPEC's decision to raise oil prices and cut production. | 1973 Establishment of the Pakistan Science Foundation. |
| | | 1973 Libyan leader Colonel Gaddafi proclaims his Third Universal Theory, which promotes socialism, popular democracy, Arab unity and progressive Islam. | 1973 The Paris Peace Accords formally recognize the sovereignty of both North and South Viet Nam and provide for the withdrawal of American troops. |
| | | 1973 Arab-Israeli War. | 1973 Australian writer Patrick White wins the Nobel Prize in Literature. |
| | | 1973 The Palestinian Engineers General Federation founded in Baghdad. | |
| | | 1973 The fourth NAM Conference in Algeria adopts the Declaration and the Programme of the New International Economic Order (NIEO). | |

| EAST ASIA (Cont.) | | THE AMERICAS (Cont.) | | INTERNATIONAL EVENTS (Cont.) | |
|---|---|---|---|---|---|
| 1970 | China launches its first space satellite. | 1970 | Marxist Salvador Allende wins the presidential election in Chile. | 1970 | UNESCO adopts the Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property. |
| 1970 | Expo '70 in Osaka, Japan, with buildings designed by Kenzo Tange and Tara Okamoto. | 1970 | Luis Federico Leloir of Argentina is awarded the Nobel Prize in Chemistry. | 1970 | Creation of the Organisation internationale de la Francophonie. |
| | | 1970 | The first US Gay Pride parade in New York City. | 1970 | Soviet Union establishes International System of Scientific and Technical Information (MSNTI). |
| | | 1970 | *Fifth Business*, by Canadian writer Robertson Davies. | | |
| 1971 | China's seat in the UN transferred from Taiwan to the People's Republic of China. | 1971 | Pablo Neruda is awarded the Nobel Prize in Literature. | 1971 | Creation of the World Economic Forum (WEF). |
| 1971 | Academy of Science established in the Republic of Korea. | 1971 | *A Theory of Justice*, by US philosopher John Rawls. | 1971 | Creation of the United Nations University in Tokyo. |
| | | 1971 | Launching of *Mariner 9*, the first spacecraft to survey Mars from its orbit. | 1971 | Creation of the international environmental organization Greenpeace. |
| | | 1971 | MARC format structure becomes an official national standard in the US. | 1971 | UNESCO creates the Man and Biosphere Programme. |
| | | | | 1971 | Convention on Psychotropic Substances. |
| | | | | 1971 | Revision of the 1952 Universal Copyright Convention. |
| 1972 | The Shanghai Communiqué issued during US President Nixon's visit to China marks the normalization of Sino-American relations. | 1972 | *Pioneer 10*, the first space probe to fly past Jupiter. | 1972 | UNESCO adopts the Convention concerning the Protection of the World Cultural and Natural Heritage. |
| 1972 | An 11-year compulsory education system initiated in the People's Democratic Republic of Korea. | 1972 | *The Godfather*, by US director Francis Ford Coppola. | 1972 | First Strategic Arms Limitation Treaty (SALT I) signed by the USA and the USSR. |
| 1972 | The Mount Asama Villa Incident in Japan. | 1972 | *Learning from Las Vegas*, by post-Modern architect Robert Venturi. | 1972 | Kurt Waldheim (Austria) is appointed UN Secretary General. |
| 1972 | The United States returns Okinawa to Japan. | 1972 | Freedom to Read Statement issued by the American Library Association and the Association of American Publishers. | 1972 | Anti-Ballistic Missile Treaty (ABM) signed by the USA and the USSR. |
| 1972 | *Pregnant with a Fox*, by Japanese writer Yuko Tsushima. | | | 1972 | The first UN Environment Conference in Stockholm leads to the establishment of the UN Environment Programme (UNEP). |
| 1972 | Rise of environment and ecology movements in Japan. | | | 1972 | Biological Weapons Convention signed by the USA, Great Britain and USSR. |
| 1973 | Republic of Korea launches a national scientific movement. | 1973 | The US Supreme Court rules recognizes the right to abortion in the landmark *Roe v. Wade* decision. | 1973 | Paris Peace Accords end the Vietnam War. |
| | | 1973 | *Skylab* Workshop launched. | | |
| | | 1973 | *Mariner 10* launched to take photographs of Venus and Mercury. | | |
| | | 1973 | Military coup in Uruguay. | | |
| | | 1973 | Establishment of the Caribbean Community and Common Market (CARICOM). | | |
| | | 1973 | MARC format structure becomes an international standard. | | |
| | | 1973 | Chilean President Salvador Allende is overthrown and assassinated in a military coup d'état led by General Augusto Pinochet. | | |
| | | 1973 | Juan Perón returns to Argentina and is re-elected President. | | |
| | | 1973 | US withdraws its troops from Viet Nam. | | |

| SUB-SAHARAN AFRICA *(Cont.)* | EUROPE *(Cont.)* | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* |
|---|---|---|---|
| 1974 *No Longer at Ease*, by Chinua Achebe. | 1974 Russian novelist Solzhenitsyn forced into exile. | 1974 *The Secret Life of Saeed the Pessoptimist*, by Palestinian writer Emile Habibi. | 1974 India conducts its first nuclear test. |
| 1974 Sudanese Emperor Haile Selassie is deposed by a military revolt. | 1974 *Salyut 3*, the first Soviet military space station is placed in orbit. | 1974 Yasser Arafat addresses the UN General Assembly, which recognizes the PLO. | 1974 *The Fat Man in History*, by Australian writer Peter Carey. |
| 1974 Guinea-Bissau achieves political independence. | 1974 Revolution of Carnations led by General Spinola topples Portugal's Caetano regime. | 1974 Peak period of the internationally recognized Iranian film industry. | 1974 Completion of the Indian Institute of Management in Ahmedabad, India, designed by American architect Louis Kahn. |
| 1974 São Tomé proclaims its independence. | | | |
| 1974 Agreement signed between FRELIMO and Portugal. | | | |
| 1975 *Dunya Uwanja wa Fujo*, by Tanzanian writer Euphrase Kezilahabi. | 1975 L. Kantrovich awarded the Nobel Prize in Economics. | 1975 The Lebanese Civil War begins. | 1975 Islamists organize an uprising against King Daoud of Afghanistan. The insurrection is harshly suppressed. |
| 1975 *Death and the King's Horsemen*, by Nigerian writer Wole Soyinka. | 1975 Emergence of the British punk movement in music, fashion and lifestyles. | 1975 Saudi King Faisal is assassinated by a member of the royal family and succeeded by King Khalid. | 1975 Papua New Guinea achieves independence. |
| 1975 Cape Verde, Mozambique and Angola are granted independence. Outbreak of civil war in Angola. | 1975 Foundation Joan Miró opens in Barcelona. | 1975 *Le Chemin des Ordalies*, by Abdellatif Laâbi. | 1975 The Khmer Rouge capture the capital of Cambodia and rename the country Democratic Kampuchea. Pol Pot leads a genocidal agro-communist regime in an attempt to establish a classless society. |
| 1975 The Economic Community of West African States (ECOWAS) is formed. | 1975 A. Sakharov awarded the Nobel Peace Prize. | 1975 The Algiers Accord settles the Iran-Iraq border dispute. | |
| | 1975 King Juan Carlos occupies the Spanish throne upon the death of Franco. | | 1975 Premiere of the Philippine film *Manila in the Claws of Neon*, directed by Lino Brocka. |
| | | | 1975 The Kingdom of Laos is renamed the Lao People's Democratic Republic after the communist movement Pathet Lao overthrows King Savang Vatthana. |
| | | | 1975 Portugal withdraws from East Timor and Indonesia invades the country. |
| | | | 1975 Saigon falls to North Viet Nam and is renamed Ho Chi Minh City. |
| 1976 Soweto uprising in South Africa. | | 1976 Creation of the Document and Research Centre at Bir Zeit University, Palestine. | 1976 *Azadi*, by Indian writer Chaman Nahal. |
| 1976 19th Session of the UNESCO General Conference takes place in Nairobi. Creation of an international commission to study communication policies. | | 1976 The National Charter, Algeria. | The Kahuta Research Laboratories established in Pakistan. |
| | | 1976 Syrian army invades Lebanon. | |
| 1976 *Black, and White in Color* (Côte d'Ivoire) wins the Oscar for Best Foreign Language Film. | | 1976 Inauguration of the National Museum in Doha (Qatar). | 1976 Viet Nam is officially unified under the North Vietnamese government as the Socialist Republic of Viet Nam. |
| 1976 *The African Origin of Civilization*, by Senegalese writer Cheikh Anta Diop. | | | |
| 1977 Steve Biko dies of brain lesions while imprisoned in South Africa. | | 1977 The Arab Intellectual Colloquium Society, Jerusalem. | 1977 *Monkey Grip*, by Australian writer Helen Garner. |
| 1977 Creation of the independent Republic of Djibouti. | | 1977 The Jordanian Armed Force starts their own orchestra with 120 performers. | |
| 1977 *Gens de la parole*, by Sory Camara. | 1977 Spanish writer Vicente Aleixandre awarded Nobel Prize in Literature. | 1977 Establishment of Jordanian Theatre League. | |
| 1977 *The Ozidi Saga*, by Nigerian writer John Pepper Clark. | 1977 Inauguration of the Centre Georges Pompidou, the Parisian cultural complex designed by Renzo Piano and Richard Rogers. | 1977 Creation of the Arabic Language Academy in Jordan. | |
| 1977 *A Man of the People*, by Chinua Achebe. | | 1977 Anwar Sadat makes an official visit to Israel, leading to Egypt's expulsion from the Arab League. | |
| 1977 The Second World of Black and African Festival of Arts and Culture (FESTAC) takes place in Nigeria. | | | |
| 1978 The island of Gorée (Senegal), former slave-trading centre, is inscribed on the UNESCO World Heritage List. | | 1978 *Orientalism*, by Palestinian-American intellectual Edward Said. | 1978 The assassination of Afghan ruler Daoud. The Soviet-supported Democratic Republic of Afghanistan is established. |
| | | 1978 Presidents Carter and Sadat and Prime Minister Begin sign the Camp David Peace Accords. The latter two are awarded the Nobel Peace Prize. | |
| 1978 *Le Ventre*, by Tchicaya U'Tamsi. | 1978 Polish archbishop Karol Wojtyła elected Pope John Paul II. | | |
| | 1978 Birth of the first 'test-tube' baby in the UK. | | |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| 1974 Discovery of the Terracotta Army in the Mausoleum of the First Qin Emperor (China). | 1974 NASA launches the first Synchronous Meteorological Satellite. | 1974 UN General Assembly adopts the Declaration and Programme of Action of the New International Order. |
| 1974 The Industrial and Technical College established in Taiwan. | 1974 Resignation of US President Richard Nixon in the wake of the Watergate scandal. | 1974 Creation of the Worldwatch Institute. |
| 1974 China and Japan establish diplomatic relations. | 1974 Completion of the Sears Tower in Chicago, tallest office building in the US. | |
| | 1974 The US Privacy Act passed. | |
| | 1974 Death of Argentine President Juan Perón, who is succeeded by his wife Isabel. | |
| 1975 Release of *Dersu Uzala*, by Japanese director Akira Kurosawa. | 1975 Foundation of Microsoft Corporation, the world's largest software company. | 1975 UNESCO launches the International Hydrological Programme. |
| 1975 Japanese choreographer, Ushio Amagatsu, founds the Sankai Juku dance theatre group. | 1975 *Les Enfants du Sabbat*, by French-Canadian poet Anne Hébert. | 1975 UN Declaration on the Rights of Disabled Persons. |
| | | 1975 First UN Conference on Women is held in Mexico City. UN proclaims the International Decade for Women. |
| 1976 Deng Xiaoping emerges as Chinese leader after the death of Mao Zedong. | 1976 *Viking 1* and 2 land on the surface of Mars. | 1976 World Tourism Organization (formerly IUOTO) becomes an executive agency of the United Nations Development Programme. |
| 1976 JVC (Japan Victor Company) introduces the VHS system. | 1976 Olympic Games held in Montreal. | |
| 1976 *In the realm of the senses*, by Japanese director Nagisa Oshima. | 1976 Premiere of *Einstein on the Beach*, opera composed by Philip Glass. | |
| | 1976 Saul Bellow is awarded the Nobel Prize in Literature. | |
| | 1976 Argentine President Isabel Perón is overthrown by a military junta led by General Videla. | |
| 1977 Establishment of the Chinese Academy of Social Sciences. | 1977 Camp David negotiations. | 1977 Tbilisi Declaration on Environmental Education. |
| | 1977 *Voyagers 1* and 2 set out for Jupiter and Saturn respectively. | |
| | 1977 Freedom of Information Act passed in the USA. | |
| | 1977 Quebec passes legislation to protect the French language from English influence. | |
| | 1977 Home computers enter the mass market in the USA. | |
| | 1977 *The Wars*, by Canadian writer Timothy Findley. | |
| 1978 The Republic of Korea builds a nuclear reactor to generate electricity for commercial purposes. | 1978 The Einstein Observatory begins its 30-day mission. | 1978 UNESCO adopts the Declaration on Race and Racial Prejudice. |
| 1978 Deng Xiaoping launches reform and political liberalization in China (Beijing Spring and Democracy Wall Movement). | 1978 *Pioneer Venus 1* and 2 reach Venus's atmosphere. | |
| | 1978 New Peruvian constitution marks the return of democratic rule. | |

| SUB-SAHARAN AFRICA (Cont.) | EUROPE (Cont.) | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB (Cont.) | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA (Cont.) |
|---|---|---|---|
| | | | 1978 Viet Nam invades Cambodia and drives the Khmer Rouge to the western border with Thailand. Civil war between the Vietnamese-sponsored Phnom Penh Government and the Khmer Rouge. |
| | | | 1978 An Afghan-Soviet mission excavates a necropolis at Tillya Tepe dating from the first century BC. |
| | | | 1978 *Poems from Aboriginal Australia*, by Australian poet and playwright Jack Davis. |
| 1979 Idi Amin is forced to flee Uganda, ending his brutal 8-year dictatorship. | 1979 First direct elections of members of the European Parliament. | 1979 The Shah of Iran flees the country. Foundation of the Islamic Republic of Iran by Ayatollah Khomeini. Iran hostage crisis. | 1979 The beginning of the Soviet occupation of Afghanistan. |
| 1979 *La Ruine presque cocasse d'un polichinelle*, by Mongo Beti. | 1979 *La Storia*, by Italian writer Elsa Morante. | | 1979 *Kullark*, by Australian poet and playwright Jack Davis. |
| | 1979 Greek poet Odysseus Elytis awarded Nobel Prize in Literature. | 1979 Saddam Hussein becomes President of Iraq. | 1979 The Roman Catholic missionary Mother Teresa receives the Nobel Peace Prize for her humanitarian work in India. |
| | | 1979 Egyptian-Israeli Peace Treaty is signed. Egypt regains control of the Sinai. | |
| | | 1979 Islamic radicals seize the Grand Mosque in Mecca. | |
| 1980 *Waiting for the Barbarians*, by South African writer J. M. Coetzee. | 1980 The Solidarity movement in Poland led by Lech Walesa. | 1980 Iran-Iraq War. | 1980 India launches its first artificial satellite. |
| 1980 Beginning of black majority rule in Zimbabwe. Robert Mugabe is prime minister. | 1980 *Betrayal*, by English playwright Harold Pinter. | 1980 Creation of the Arab Studies Society in Jerusalem devoted to Palestinian research. | 1980 King Birendra of Nepal carries out democratic reforms. |
| 1980 Creation of the Southern Africa Development Co-ordination Conference (SADCC). | | 1980 Fine Arts Department established in Yarmonk University, Jordan. | |
| 1980 Malaria epidemic in Madagascar. | | 1980 The first Gulf War. | |
| | | 1980 A popular protest against the Algerian Government's refusal to recognize the Berber language is violently repressed. | |
| 1981 *July's People*, by South African Nobel Prize winner Nadine Gordimer. | 1981 The European Space Agency launches the third *Ariane* rocket. | 1981 The assassination of President Anwar Sadat by members of the Islamic Jihad. He is succeeded by Hosni Mubarak. | 1981 Philippine President Marcos officially lifts martial law before the visit of Pope John Paul II. |
| 1981 *The Unbroken Song*, by Es'kia Mphalele of South Africa. | 1981 Picasso's *Guernica* transferred to Spain. | 1981 Foundation of the Rural Studies Centre in al-Najah National University, Palestine. | 1981 *Bliss*, by Australian writer Peter Carey. |
| | 1981 *The Name of the Rose*, by Italian writer Umberto Eco. | 1981 The Jordanian company for Television and Cinema production is founded. | 1981 *The Day of the Dog*, by Australian writer Archie Weller. |
| | 1981 *Three Arched Bridge*, by Albanian writer Ismail Kadaré. | 1981 The Royal Academy for Islamic Civilization Research is established in Jordan. | |
| | 1981 Greece joins the European Communities. | 1981 Creation of the Cooperation Council for the Arab States of the Gulf. | |
| | 1981 Socialist François Mitterrand elected as French President. | | |
| 1982 Passage of the Internal Security Act authorizing the South African Government to ban organizations and individuals. | 1982 Death of Lenoid Brezhnev. | 1982 Sabra and Shatila massacres in Southern Lebanon. | 1982 The Department of Non-Conventional Energy Sources created in India. |
| 1982 *Les Deux mères de Guillaume Ismaël Dzewatama*, by Mongo Beti. | 1982 *The Book of Disquiet*, by Fernando Pessoa, published posthumously. | 1982 Assassination of Lebanese President Bashir Gemayal. | 1982 Inauguration of Jatiyo Sangshad Bhaban, the National Assembly Building in Dhaka, Bangladesh, considered the masterpiece of American architect Louis Kahn. |
| 1982 *Ngagihika Naadenda*, a play written in the Gikuyu language by Ngugi wa Thiong'o, is banned by Kenyan authorities. | 1982 *The Meistersinger*, by German neo-expressionist painter Anselm Kiefer. | 1982 The Shiite political party, Hezbollah, is founded in Lebanon. | |
| 1982 Western Sahara achieves independence. | 1982 Commercialization of the Compact Disc (CD), developed by Philips and Sony. | 1982 *Voices of Israel*, by Amos Oz. | |
| | | 1982 *Le Fleuve détourné*, by Algerian author Rachid Mimouni. | |
| | | 1982 Yasser Arafat and the PLO leave Beirut for Tunis. | |
| | | 1982 The University Graduates League Research Centre in al-Khalil (Hebron), Palestine. | |
| | | 1982 Israel invades Lebanon. | |

| EAST ASIA *(Cont.)* | | THE AMERICAS *(Cont.)* | | INTERNATIONAL EVENTS *(Cont.)* | |
|---|---|---|---|---|---|
| 1978 | Beginning of Chinese economic reforms. | | | | |
| 1978 | The Chinese Government decides to compile the *Chinese Encyclopaedia*. | | | | |
| 1979 | The National Education Law is passed in Taiwan. | 1979 | The Sandinista National Liberation Front overthrows the Somoza regime in Nicaragua. | 1979 | UN adopts the Convention on the Elimination of All Forms of Discrimination against Women. |
| 1979 | The Sony Walkman is invented by Akio Morita, Masaru Ibuka and Kozo Ohsone. | 1979 | *Pioneer 11* takes the first close-up photographs of Saturn. | 1979 | Second Strategic Arms Limitation Treaty (SALT II). |
| 1979 | USA and China establish full diplomatic relations. | 1979 | US writer Isaac Bashevis Singer is awarded the Nobel Prize in Literature. | | |
| 1979 | China adopts 'one-child' policy. | 1979 | *Buried Child*, by US playwright Sam Shepard. | | |
| 1979 | Deng Xiaoping's four cardinal principles. | 1979 | *The Kiss of the Spider Woman*, by Argentine writer Manuel Puig. | | |
| 1980 | *Tales of Crazy Winds*, by Japanese writer Jun Ishikawa. | 1980 | Assassination of Archbishop Romero of San Salvador. | 1980 | World Health Organization (WHO) officially declares smallpox eradicated. |
| 1980 | Hsinchu Science Park opens in Taiwan. | 1980 | Development of infrared array detectors. | | |
| 1980 | *Woman Running in the Mountains*, by Japanese writer Yuko Tsushima. | 1980 | Inauguration of the Canadian Museum of Civilization outside Ottawa, Canada. | | |
| 1980 | China launches a long-distance carrier rocket. | 1980 | The PC ('political correctness') debate sweeps US college campuses. | | |
| 1980 | Trial of the Gang of Four in China. | 1980 | Ronald Reagan is elected US President. | | |
| 1980 | Release of *The Shadow Warrior*, by Japanese director Akira Kurosawa. | 1980 | Former Beatle John Lennon is assassinated in front of his New York home. | | |
| | | 1980 | Latin American Integration Association (ALADI) replaces LAFTA. | | |
| | | 1981 | The first *Columbia* space shuttle is launched. | 1981 | UN adopts the Declaration on the Elimination of All Forms of Intolerance and Discrimination Based on Religion or Belief. |
| | | 1981 | *Tar Baby*, by African-American writer Toni Morrison. | | |
| 1982 | IBM industrial espionage incident in Japan. | 1982 | Gabriel Garcia Márquez is awarded the Nobel Prize in Literature. | 1982 | Javier Pérez de Cuéllar (Peru) is appointed UN Secretary General. |
| 1982 | Taiwanese authorities promulgate compulsory education for children from the age of 6 to 15 years. | 1983 | The Space Shuttle *Challenger* lifts off for its first mission. | | |
| | | 1983 | The USA invades Grenada. | | |
| | | 1983 | The Space Shuttle *Columbia* carries the spacelab of the European Space Agency (ESA) into orbit. | | |

| SUB-SAHARAN AFRICA *(Cont.)* | EUROPE *(Cont.)* | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* |
|---|---|---|---|
| 1983 Léopold Senghor is the first African writer to be elected to the prestigious French Academy.<br><br>1983 Thomas Sankara is appointed prime minister in Upper Volta, renamed Burkina Faso in 1984.<br><br>1983 First professional market for film and television (MIC) organized in the framework of the Pan-African film festival (FESPACO). | 1983 The human immunodeficiency retrovirus (HIV), which causes AIDS, is first isolated by researchers at the Pasteur Institute in Paris.<br><br>1983 Soviet *Venera 13* and *14* land on Venus and transmit colour photos. | 1983 *The Lamb's Smile*, by Israeli writer David Grossman.<br><br>1983 The scientific and industrial policy of Iran (Islamic Republic of) aimed at the improvement of higher education.<br><br>1983 Iran's Islamic government creates the Farabi Cinema Foundation to promote and control national film production. | 1983 Indira Gandhi releases the Technology Policy Statement at the Indian Science Congress.<br><br>1983 Tensions between the Sri Lankan Sinhalese majority and the Tamil minority erupt in violence, marking the beginning of a period of ethnic conflict.<br><br>1983 Establishment of the Aga Khan University, the first private university in Pakistan.<br><br>1983 *Doctor Wooreddy's Prescription for Enduring the Ending of the World*, by Australian writer Colin Johnson.<br><br>1983 *The Bone People*, by New Zealand writer Keri Hulme. |
| 1984 *La Revanche de Guillaume Ismaël. Dzewatana*, by Mongo Beti. | 1984 Czech writer Jaroslav Seifert awarded Nobel Prize in Literature.<br><br>1984 *The Unbearable Lightness of Being*, by Czech writer Milan Kundera, published in French. | 1984 The private Bilkent University opens in Ankara, Turkey.<br><br>1984 Enactment of the Algerian Family Code based on traditional Islamic law. | 1984 The Golden Temple Massacre at Amritsar, India.<br><br>1984 The National Science and Technology Policy is framed in Pakistan.<br><br>1984 Assassination of Indian Prime Minister Indira Gandhi. Her son, Rajiv Gandhi, succeeds her.<br><br>1984 Brunei Darussalam becomes a fully independent state.<br><br>1984 *The Children's Bach*, by Australian writer Helen Garner. |
| 1985 *Les Sept Solitudes de Lorsa Lopez*, by Brazzaville's S. L. Tansi.<br><br>1985 *African Short Stories*, edited by Chinua Achebe and C. L. Innes.<br><br>1985 West African Film Corp (WAFC) created by Ousmane Sembene (Senegal), Souleymane Cisse (Mali) and other African intellectuals.<br><br>1985 Julius Nyerere voluntarily retires from the Tanzanian presidency. | 1985 Advocate of *perestroika* and *glasnost*, Mikhail Gorbachev becomes the leader of the Soviet Union.<br><br>1985 The first joint German/ESA mission launches *Spacelab D1*. | 1985 The Islamic Research Centre opens in Jerusalem, Palestine.<br><br>1985 PLO headquarters in Tunis bombed by the Israeli air force.<br><br>1985 *Ombre Sultane*, by Algerian writer Assia Djebar.<br><br>1985 Formerly banned, Rai music gains increasing popularity in Algeria.<br><br>1985 Morocco withdraws from the Organization of African Unity (OAU) following the admission of Western Sahara.<br><br>1985 Economic Cooperation Organization established by Turkey, Iran (Islamic Republic of) and Pakistan to promote sustainable socio-economic development. | 1985 The Treaty of Rarotonga creates a nuclear-weapon-free zone in the South Pacific.<br><br>1985 *Rich Like Us*, by Indian writer Nayantara Sahgal. |
| 1986 Nigerian writer Wole Soyinka is the first African to receive the Nobel Prize in Literature.<br><br>1986 *Masimba Avanhu*, by Chenjerai Hove from Zimbabwe. | 1986 The *Giotto* space probe, launched by the European Space Agency, photographs Halley's Comet.<br><br>1986 Spain and Portugal join the European Communities.<br><br>1986 Launching of the core module of the Soviet space station *Mir*.<br><br>1986 Elie Wiesel awarded the Nobel Peace Prize.<br><br>1986 Chernobyl nuclear accident in Ukraine. | 1986 *See Under: Love*, by Israeli writer David Grossman.<br><br>1986 *Sexuality in Islam*, by Tunisian sociologist Adbelwahab Bouhdiba.<br><br>1986 *Birth at Dawn*, final novel in the Berber trilogy by Driss Chraïbi.<br><br>1986 Foundation of Sultan Qaboos University in Oman.<br><br>1986 A Palestinian book exhibition is raided by Israel authorities. | 1986 Marcos is driven into exile. Corazon Aquino becomes president of the Philippines.<br><br>1986 *The Son*, by Bengali writer Mahasveta Devi. |
| 1987 *Anthills of the Savannah*, by Chinua Achebe.<br><br>1987 Robert Mugabe is Zimbabwe's first executive president.<br><br>1987 *Sozaboy*, by Nigerian human rights activist Ken Saro-Wiva. | 1987 Poet Joseph Brodsky awarded the Nobel Prize in Literature.<br><br>1987 Cosmonaut Yuri V. Romaneko returns from space station *Mir*. | 1987 *Miramar*, by Naguib Mahfouz.<br><br>1987 *La Nuit sacrée*, by Moroccan writer Tahar Ben Jelloun, first Arab winner of le Prix Goncourt, prestigious French literary award.<br><br>1987 Beginning of the First Intifada. | 1987 Maori becomes an official language in New Zealand.<br><br>1987 A new constitution is adopted in the Philippines. |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| 1983 Release of *The Ballad of Narayama*, by Japanese director Shohei Imamura. | 1983 Canadian Privacy Act passed.<br>1983 The Infrared Astronomical Satellite (IRAS) discovers new comets, asteroids, galaxies, and evidence of new planets. | |
| 1984 *Wings of the Sun*, by Japanese writer Kenji Nakagami.<br>1984 Japan adopts 'internationalization' in favour of 'technonationalism'.<br>1984 Labor Standards Law enacted in Taiwan.<br>1984 China and Britain conclude agreement on Hong Kong's return to Mainland China.<br>1984 Foundation of the Japan Contemporary Art Association. | 1984 César Milstein of Argentina is awarded the Nobel Prize in Medecine.<br>1984 *Challenger* crew member Katherine Sullivan is the first woman to walk in space.<br>1984 Philip Johnson's AT&T Building in New York is considered the first post-modern skyscraper.<br>1984 Bruce McCandless takes the first untethered space walk from the Space Shuttle *Challenger* (STS-41-B).<br>1984 Olympic Games held in Los Angeles.<br>1984 *Glengarry Glen Ross*, by US playwright David Mamet.<br>1984 Democracy returns to Uruguay. | 1984 United States withdraws from UNESCO. |
| 1985 Reform of the Chinese educational system is undertaken.<br>1985 Launching of the first Japanese deep space probe, *Sakigake*.<br>1985 *Bedtime Eyes*, by Japanese writer Eimi Yamada. | 1985 Emergence of desktop publishing in the US.<br>1985 *Gringo Viejo*, by Mexican author Carlos Fuentes. | 1985 United Kingdom and Singapore withdraw from UNESCO.<br>1985 Third World Conference on Women in Nairobi.<br>1985 Adoption of the Vienna Convention for the Protection of the Ozone Layer.<br>1985 UN adopts the Convention against Torture.<br>1985 First International AIDS Conference held in Atlanta (USA).<br>1985 OECD Declaration on Transborder Data Flow. |
| 1986 Law on Compulsory Education promulgated in China.<br>1986 Taiwanese physicist Yuan T. Lee is awarded the Nobel Prize in Chemistry. | 1986 *Challenger* explodes during launching, killing the seven astronauts on board.<br>1986 *Voyager* 2 passes Uranus. | |
| 1987 Martial law lifted in Taiwan.<br>1987 Japanese architect Kenzo Tange wins the Pritzker Prize. | 1987 Nicaragua's Sandinista Government ratifies a new constitution. | 1987 UN adopts the Treaty on the Protection of the Ozone Layer (Montreal Protocol). |

| SUB-SAHARAN AFRICA *(Cont.)* | EUROPE *(Cont.)* | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* |
|---|---|---|---|
| | | 1987 Payame Noor University, devoted to distance teaching, is established by the Iranian Supreme Council of the Cultural Revolution. | |
| 1988 *Bones*, by Zimbabwean writer Chenjerai Hove. | | 1988 *The Black Box*, by Israel writer Amos Oz. | 1988 *The Chessmaster and His Moves*, by Indian writer Raja Rao. |
| | | 1988 Naguib Mahfouz is the first writer in Arabic to receive the Nobel Prize in Literature. | |
| | | 1988 In the wake of harshly repressed popular riots, the Algerian Government allows greater freedom of expression, resulting in numerous new publications and political parties. | |
| | 1989 Fall of the Berlin Wall. | 1989 Ayatollah Khomeini issues a *fatwa* (death sentence) on Salmon Rushdie, author of *The Satanic Verses*. Ali Akbar Hashemi Rafsanjani is elected president of Iran after Khomeini's death. | 1989 The Soviet Union withdraws its troop from Afghanistan, leaving Mohammad Najibulla in power. |
| | 1989 Spanish writer Camilo José Cela awarded the Nobel Prize in Literature. | | 1989 The military government renames the Union of Burma the Union of Myanmar. |
| | 1989 *The Forgotten*, by Elie Wiesel. | | 1989 Release of the Indian romantic musical *Maine Pyar Kiya (I Fell in Love)*, one of the most successful 'Bollywood' films. |
| | 1989 Romania's communist leader, Nicolae Ceauşescu, is executed in the aftermath of a popular uprising. | | 1989 *The Great Indian Novel*, by Shashi Tharoor. |
| 1990 The liberation of Nelson Mandela and the abolition of the apartheid regime in South Africa. | 1990 Alexis II elected Patriarch of the Russian Orthodox Church. | 1990 *The Five-Season Year* and *Mar Mani*, by Israeli writer Avraham B. Yehoshua. | 1990 Free elections are held in the Union of Myanmar (Burma) for the first time in 30 years. The victory of the National League for Democracy, lead by Aung San Suu Kyi, is nullified by the military. |
| 1990 *Monné, outrages et défis*, by Ahmadou Kourouma. | 1990 German reunification. | 1990 *Jour de silence à Tanger*, by Tahar Ben Jelloun. | |
| 1990 Consecration of Africa's largest place of worship, the Basilica of Our Lady of Peace of Yamoussoukro in Côte d'Ivoire. | 1990 Italian architect Aldo Rossi is awarded the Pritzker Prize. | 1990 North and South Yemen are united to form the Republic of Yemen. | 1990 The World Conference on Education for All, Jomtien, Thailand. |
| 1990 Namibia achieves independence. | | 1990 *The Black Book*, by Turkish writer Orhen Pamuk. | 1990 *Bombay Duck*, by Indian writer Farrukh Dhondy. |
| | | 1990 *Encyclopedia of the Holocaust* published in Israel. | |
| | | 1990 Victory of the Islamic Salvation Front in Algeria. | |
| | | 1990 Iraq invades Kuwait, launching the First Gulf War. | |
| | | 1990 Taif Agreement ends the Lebanese Civil War. | |
| 1991 *Amkonllel, l'enfant peul*, by Amadou Hampâté Bâ. | 1991 *The Gospel According to Jesus Christ*, by Portuguese writer José Saramago. | 1991 *Chronique frontalière*, by Emna Bel Haj Yahia. | 1991 The former Soviet republics of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan achieve independence. |
| 1991 Nadine Gordimer is awarded the Nobel Prize in Literature. | 1991 *The Physical Impossibility of Death in the Mind of Someone Living*, by British artist Damien Hirst, winner of the Turner Prize in 1995. | 1991 Second Gulf War between Iraq and a coalition led by USA and UK. Land operations known as 'Desert Storm'. | 1991 Nepal holds its first elections in nearly 50 years. |
| 1991 Eritrea secedes from Ethiopia and becomes independent following a long armed struggle. | 1991 Resignation of Gorbachev. Creation of the Commonwealth of Independent States (CIS) marks the dissolution of the Soviet Union. Soviet republics achieve independence. Boris Yeltsin is the first democratically elected president of the Russian Federation. | | 1991 The eruption of Mount Pinatubo (Philippines). |
| | | | 1991 Assassination of former Indian Prime Minister Rajiv Gandhi. |
| | | | 1991 Burmese pro-democracy activist Aung San Suu Kyi wins the Nobel Peace Prize. |
| 1992 *Afrique, Je te plumerai*, by Cameroonian filmmaker Jean-Marie Teno. | 1992 Treaty of Maastricht. The European Union decides to introduce a single European currency. | 1992 The Algerian Government cancels the legislative elections to avoid Islamist victory and sparks a violent, protracted civil war. | 1992 Hindu fanatics destroy the Muslim place of worship Babri Masjid (India). |
| | 1992 Outbreak of the Bosnian conflict. | 1992 Egyptian diplomat Boutros Boutros-Ghali becomes UN Secretary-General. | 1992 Outbreak of a civil war between mujahidin warlords in Afghanistan. |
| | 1992 Olympic Games in Barcelona. | | 1992 Suchinda Kraprayoon, the last military ruler in Thailand, cedes power in the face of massive popular protest. The country becomes a functioning democracy. |
| | 1992 Expo '92 in Seville, Spain. | | |

| EAST ASIA *(Cont.)* | | THE AMERICAS *(Cont.)* | | INTERNATIONAL EVENTS *(Cont.)* | |
|---|---|---|---|---|---|
| 1988 | China lifts bans on publishing newspapers. | | | 1988 | UNESCO inaugurates the World Decade for Cultural Development. |
| 1988 | The Olympic Games held in Seoul. | | | 1988 | UN adopts the Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances. |
| | | | | 1988 | Nobel Peace Prize is awarded to UN peacekeeping operations. |
| | | | | 1988 | WHO declares the first World AIDS Day. |
| 1989 | Tiananmen Square protests in Beijing. | 1989 | NASA launches the COBE satellite to study cosmic microwave background radiation. | 1989 | Adoption of the United Nations Convention on the Rights of the Child. |
| 1989 | First International Biennale Tokyo Art Fair (NICAF). | 1989 | Space Shuttle *Atlantis* deploys *Magellan* and *Galileo* probes. | | |
| 1989 | Akihito becomes Emperor of Japan following the death of his father, Hirohito. | 1989 | General Manuel Noriega is ousted in the wake of the US invasion of Panama. | | |
| 1989 | Youth meeting in Pyongyang in the Democratic People's Republic of Korea. | 1989 | *Plateau Mont-Royal Chronicles*, by French-Canadian writer Michel Tremblay. | | |
| 1990 | Japanese director Akira Kurosawa receives an honorary award from the American Film Academy. | 1990 | *Agosto*, by Brazilian writer Rubem Fonseca. | 1990 | UNICEF convenes the World Summit for Children. |
| | | 1990 | Space Shuttle *Discovery* deploys Hubble Space Telescope (HST). | 1990 | UNESCO creates the 'Memory of the World' programme. |
| 1990 | Japanese fashion designer Issey Miyake launches his 'Pleats Please' brand. | 1990 | *Magellan* arrives at Venus. | 1990 | UN World Conference on 'Education for All' held in Thailand. |
| | | 1990 | The Sandinistas are defeated in Nicaraguan elections. Violeta Chamorro heads the new governement. | | |
| | | 1990 | Establishment of several museums in Mexico devoted to history, culture, and pre-Hispanic and modern art. | | |
| | | 1990 | The US Government creates the Human Genome Project. | | |
| | | 1990 | Mexican poet Octavio Paz awarded the Nobel prize in Literature. | | |
| 1991 | The Women's World Cup takes place in China. | 1991 | Creation of the South American Common Market (MERCOSUR). | 1991 | First Strategic Arms Reduction Treaty (START I). |
| | | 1991 | Space Shuttle *Atlantis* carries the Compton Gamma Ray Observatory into orbit. | | |
| | | 1991 | *Pinocchio in Venice*, by US writer Robert Coover. | | |
| 1992 | Taedok Science Town in the Republic of Korea opens. | 1992 | Derek Walcott is awarded the Nobel Prize in Literature. | 1992 | UN Conference on Environment and Development (Earth Summit) in Rio de Janeiro. |
| | | 1992 | *The English Patient*, by Canadian writer Michael Ondaatje. | 1992 | Boutros Boutros-Ghali (Egypt) is appointed UN Secretary-General. |
| | | 1992 | Guatemalan human rights activist Rigoberta Menchú awarded the Nobel Peace Prize. | 1992 | WHO removes homosexuality from its international classification of diseases. |
| | | 1992 | First mission of Space Shuttle *Endeavour*. | | |
| | | 1992 | Bill Clinton defeats George Bush in the US Presidential election. | | |

| SUB-SAHARAN AFRICA *(Cont.)* | | EUROPE *(Cont.)* | | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* | |
|---|---|---|---|---|---|---|---|
| | | | | | | 1992 | *The Sorrow of War*, by Vietnamese writer Ninh Bao. |
| 1993 | Genocide in Burundi. | 1993 | UN establishes the International Criminal Tribunal for the former Yugoslavia. | 1993 | Private universities founded in 80 towns in Iran (Islamic Republic of). | 1993 | Premiere of *The Piano*, by New Zealand director Jane Campion. |
| 1993 | The Nobel Peace Prize is awarded to Nelson Mandela and F. W. de Klerk. | 1993 | Ratification of the Constitution of the Russian Federation. | 1993 | Taha agreement signed, expanding PLO autonomy. | 1993 | The United Nations sponsor elections in Cambodia. Prince Sihanouk is restored to the throne. |
| | | | | 1993 | Oslo Accords signed by Israel and PLO. | 1993 | UNESCO launches a campaign to safeguard the World Heritage Site of Angkor (Cambodia). |
| | | | | 1993 | *The Rock of Tanios*, by Lebanese writer Amin Maalouf. | | |
| 1994 | Nelson Mandela is elected president in South Africa's first multiracial and democratic elections. Publication of *Long Walk to Freedom: The Autobiography of Nelson Mandela*. | 1994 | Russian cosmonaut Sergei Krikalev participates in the first joint US/Russian Space Shuttle Mission aboard STS-60. | 1994 | UN Conference on Population and Environment, Cairo. | 1994 | The Science and Technology Development Act in Sri Lanka. |
| 1994 | The UN Security Council creates the Criminal Tribunal for Rwanda (ICTR), following the ethnic cleansing of the Tutsis by the Hutu majority. | 1994 | President Yeltstin sends Russian troops into Chechnya. | 1994 | Cairo Agreement. Yasser Arafat returns to Palestine. Jordan and Israel sign peace treaty. | 1994 | *Reef*, by exiled Sri Lankan writer Romesh Gunesekera. |
| | | 1995 | Austria, Finland and Sweden join the European Union, which now comprises 15 countries. The Schengen Agreement comes into force. | 1995 | *Why Did You Leave Your Horse All Alone*, by Palestinian poet Mahmoud Darwish. | 1995 | *A Mute's Soliloquy*, by Indonesian writer Pramoedya Ananta Toer. |
| | | 1995 | A. Solzhenitsyn returns to Russia. | 1995 | A coup d'état brings Sheikh Hamad bin Khalifa Al Thani to power in Qatar. | 1995 | *The Calcutta Chromosome*, by Indian writer Amitav Ghosh. |
| | | 1995 | Signature of the Dayton Accords ends the conflict in Bosnia. | 1995 | Oslo II Accords. | | |
| | | 1995 | The Nobel Peace Prize is awarded to Polish-born British physicist and anti-nuclear activist Joseph Rotblat. | 1995 | Assassination of Prime Minister Yitzak Rabin by a Jewish radical. | | |
| | | 1995 | 'Dogme 95' film movement spearheaded by Danish director Lans van Trier. | | | | |
| | | 1995 | The European Space Agency launches the Infrared Space Observatory (ISO). | | | | |
| | | 1995 | Bulgarian-born artist Christo wraps the Reichstag in Berlin. | | | | |
| 1996 | The PALOP (African Portuguese-speaking Countries) joins the CPLP (Community of Portuguese-speaking Countries). | 1996 | Birth of the sheep 'Dolly', the first mammal to be experimentally cloned. | 1996 | Yasser Arafat is elected President of the Palestinian Authority. | 1996 | The Taliban seize power in most of Afghanistan and impose a strict interpretation of Islamic law. |
| | | 1996 | Polish writer Wislawa Szymborska awarded the Nobel Prize in Literature. | 1996 | *Peur et mensonge*, by Algerian author Aïssa Khelladi. | 1996 | *The God of Small Things*, by Indian writer Arundhati Roy. |
| | | | | 1997 | Closed since 1975 owing to war, the restored National Museum in Beirut reopened. | 1996 | Completion of the Petronas Twin Towers in Kuala Lumpur, Malaysia. |
| | | | | | | 1996 | The Communist Party of Nepal launches the 'People's War' to overthrow the existing monarchic state and establish a communist republic. |
| 1997 | Kofi Annan is the first UN Secretary-General from a black African nation (Ghana). | 1997 | Germany passes laws prohibiting pornography and racism in cyberspace. | 1997 | *Al-Nihayat (Endings)*, by Jordanian-born writer Abdel Rahman Munif. | 1997 | The beginning of the Asian financial crisis. |
| | | 1997 | Controversy surrounding the 'Sensation' exhibit at the Royal Academy in London featuring 'Young British Artists' group (Damien Hirst, Rachel Whiteread). | | | 1997 | Foundation of the Sri Lankan National Research Council. |
| | | 1997 | Treaty of Amsterdam. | | | | |
| | | 1997 | Inauguration of the Guggenheim Museum in Bilbao, Spain designed by Frank Gehry. | | | | |
| | | 1998 | Launching of *Zarya*, the first component of the International Space Station (ISS). | 1998 | *Si Diable veut*, by Mohammed Dib. | 1998 | President Suharto of Indonesia resigns amidst widespread civil unrest. B. J. Habibie becomes Indonesia's third president. |
| | | 1998 | Portuguese writer José Saramago awarded the Nobel Prize in Literature. | 1998 | First successful deployment of the Israeli Arrow Anti-Ballistic Missile, funded largely by the USA. | | |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| 1993 *The Chinese Encyclopedia* completed. | 1993 Islamic terrorists plant a bomb in New York's World Trade Center, killing six people. | 1993 Chemical Weapons Convention is open for signature. |
| 1993 Avant-garde artist Yayoi Kusama represents Japan at the Venice Biennale. | 1993 Toni Morrison is awarded the Nobel Prize in Literature. | 1993 Creation of the Office of the United Nations High Commissioner for Human Rights. |
| 1993 EXPO '93 held in Taejon in the Republic of Korea. | | 1993 UNESCO launches the Red Book of Languages in Danger of Disappearing. |
| 1994 Kenzaburo Oe is awarded the Nobel Prize in Literature. | 1994 Russian cosmonaut Sergei Krikalev flies on board the US Space Shuttle *Discovery*. | 1994 International Conference on Population and Development in Cairo. |
| 1994 China launches a new type of rocket, Chang Zheng No. 3A. | 1994 Creation of the Brazilian Space Agency. | 1994 World Summit on Trade Efficiency in Colombus (USA). |
| 1994 National health insurance instituted in Taiwan. | 1994 The US Library of Congress announces the National Digital Library Program. | |
| 1994 Inauguration of the Museum of Modern Art in Wakayama designed by Japanese architect Kisho Kurokawa. | 1994 North American Free Trade Agreement (NAFTA) signed by the USA, Canada and Mexico. | |
| 1995 Japan launches the Infrared Telescope in Space (IRTS). | 1995 Space Shuttle *Atlantis* flies to Russian space station *Mir*. | 1995 European Organization for Nuclear Research (CERN) launches the World Wide Web. |
| 1995 The Great Hanshin earthquake near the city of Kobe, Japan. | 1995 The *Galileo* spacecraft arrives at Jupiter. | 1995 Creation of the World Trade Organization and entry into force of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). |
| 1995 Sarin gas attack on the Tokyo subway perpetrated by members of the AUM Shinrikyo cult. | | 1995 Creation of Oxfam International. |
| 1995 Japanese architect Tadao Ando is awarded the Pritzker Prize. | | 1995 World Summit for Social Development in Copenhagen. |
| 1995 The Chinese He Liang-He Li Fund prizes awarded to Qian Xuesen, Huang Jiqing, Wang Ganchang and Wang Daheng. | | 1995 UN proclaims the beginning of the International Decade for the World's Indigenous People. |
| 1995 First DVD players and discs commercialized in Japan. | | 1995 Fourth World Conference on Women held in Beijing. |
| 1995 Chinese population reaches 1.2 billion. | | |
| 1995 *Chronicle of a Blood Merchant*, by Chinese writer Yu Hua. | | |
| 1996 The first DVD players and discs available in Japan. | 1996 US President Clinton is elected to a second term. | 1996 UN adopts the Comprehensive Nuclear Test Ban Treaty (CTBT). |
| 1996 Lee Teng-hui is the first directly elected president of Taiwan. | 1996 Olympic Games in Atlanta. | 1996 World Intellectual Property Organization (WIPO) adopts the Copyright Treaty. |
| | | 1996 Creation of UNAIDS, the Joint United Nations Programme on HIV/AIDS. |
| | | 1996 UN establishes the 'Oil-for-Food' Programme. |
| | | 1996 Creation of the Community of Portuguese Language Countries (CPLP). |
| 1997 Animated film *Princess Mononoke*, by Japanese director Hayao Miyazaki awarded the Best Picture Award by the Japanese Film Academy. | 1997 The Getty Center in Los Angeles opens. | 1997 Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction. |
| 1997 UK returns Hong Kong to the People's Republic of China. | | 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change. |
| 1997 *Fireworks*, by Japanese director Takeshi Kitano. | | 1997 UNESCO adopts the Universal Declaration on the Human Genome and Human Rights. |
| 1998 The Akashi-Kaikyo Bridge (Japan) is opened to traffic. | 1998 *The Love of a Good Woman*, by Canadian writer Alice Munro. | 1998 Establishment of the Rome Statute of the International Criminal Court. |
| 1998 Japan launches the *Nozomi* probe to Mars. | 1998 *Lunar Prospector* is the first NASA mission to the Moon in 25 years. | |

| SUB-SAHARAN AFRICA *(Cont.)* | EUROPE *(Cont.)* | WEST ASIA, THE MIDDLE EAST AND THE MAGHREB *(Cont.)* | CENTRAL, SOUTH, SOUTH-EAST ASIA AND OCEANIA *(Cont.)* |
|---|---|---|---|
| | 1998 The Belfast Agreement brings peace to Northern Ireland. | | 1998 India conducts a series of underground nuclear tests prompting the USA and Japan to impose economic sanctions. |
| | 1998 Inauguration of the Vasco da Gama Bridge in Lisbon. | | |
| 1999 Thabo Mbeki is elected President of the Republic of South Africa. | 1999 Russian President Yelstin resigns in favour of Vladimir Putin. Second Chechen War. | 1999 Confrontation between militant students and government forces on the campus of Tehran University. | 1999 In a UN-conducted popular consultation, the people of East Timor vote overwhelmingly for independence. The United Nations Transitional Authority in East Timor assumes administration of the country. |
| | 1999 *My Century*, by Günter Grass. | 1999 Algerian President Abdelaziz Bouteflika introduces National Concord plan to resolve civil strife. | |
| | 1999 Poland, the Czech Republic, and Hungary join NATO. | 1999 Death of King Hussein of Jordan. | |
| | | 1999 *Children of Heaven*, by Iranian director Majid Majidi, is nominated for the Best Foreign Film Oscar. | |
| | | 1999 *Kadosh*, by Israeli director Amos Gitai. | |
| | | 1999 The Nubia Museum in Aswan, Egypt is inaugurated. | |
| | | 1999 Hamad Al Khalifa becomes ruler of Bahrain. | |
| 2000 An amendment to Zimbabwe's Constitution allows the seizure of white-owned farmland. | 2000 The first crew occupies the ISS. | 2000 Ariel Sharon's visit to the Al-Harem As-Sharif complex in Jerusalem sparks widespread riots in Palestine. | 2000 The Summer Olympics are held in Sydney, Australia. |
| | 2000 Treaty of Nice. | 2000 Death of Syrian leader Hafiz al-Assad | |
| | 2000 Dutch architect Rem Koolhass awarded the Pritzker Prize. | | |
| 2001 Organization of African Unity (OAU) is replaced by the African Union. | 2001 The first 'space tourist', Dennis Tito, pays the Russians $20 million to travel to the ISS on a Soyuz spacecraft. | | 2001 Despite international protest, the ancient Buddha statues in Bamiyan are destroyed by the Taliban, who consider the images idolatrous. |
| 2001 Approximately 70 per cent of the 40 million people living with HIV worldwide reside in sub-Saharan Africa. | | | 2001 In the wake of the 11 September terrorist attacks, a US-led coalition invades Afghanistan in an attempt to capture Osama bin Laden, leader of al-Qaeda. The Taliban are overthrown and a provisional government is formed under Hamid Karzai. |
| 2001 Death of Leopold Senghor. | | | 2001 A ceasefire is concluded in the Sri Lankan civil war. Norway mediates the peace process. |

| EAST ASIA *(Cont.)* | THE AMERICAS *(Cont.)* | INTERNATIONAL EVENTS *(Cont.)* |
|---|---|---|
| 1999 China launches the *Shenzhou* spacecraft. | 1999 President Clinton is acquitted in impeachment trial. | 1999 Anti-globalization protest at the WTO meeting in Seattle (USA). |
| 1999 The Chi-Chi earthquake (Taiwan) claims over 2,400 victims. | 1999 NASA's *Mars Polar Lander* lifts off on its ill-fated mission to Mars. Contact with the probe is lost on 3 December 1999. | |
| 1999 Portuguese government transfers sovereignty over Macau to China. | | |
| 1999 The Japanese Sony Corporation launches AIBO, the robotic dog. | | |
| 2000 Gao Xingjian is awarded the Nobel Prize in Literature. | 2000 Space Shuttle *Endeavour* lifts off to carry out the shuttle Radar Topography Mission, co-sponsored by NASA and the National Imagery and Mapping Agency. | 2000 Patent Law Treaty (PLT). |
| | | 2000 Second Strategic Arms Reduction Treaty (START II). |
| | | 2000 UN Millennium Declaration. |
| | 2000 NEAR (Near Earth Asteroid Rendezvous) probe settles into orbit around asteroid 433 Eros, producing a series of stunning close-up images. | |
| | 2000 George W. Bush becomes US President in contested election. | |
| 2001 China accedes to the World Trade Organization. | 2001 Terrorist attacks on the World Trade Center twin towers in New York City and the Pentagon in Washington. | 2001 UNESCO Universal Declaration on Cultural Diversity. |
| | | 2001 UNESCO adopts the Convention on the Protection of the Underwater Cultural Heritage. |
| | 2001 US Congress passes the Patriot Act. | 2001 First World Social Forum in Porto Alegre. |

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# PLATES

*Plate 1* Isaak Brodsky, oil portrait (1930) of Lenin at the Smolny Institute, St Petersburg (conserved at the Historical Museum in Moscow). In 1917, the Russian leader chose the building as Bolshevik headquarters during the October Revolution (Photo © DeA Picture Library).



*Plate 2* Rosa Luxemburg and members of Germany's Independent Socialist Democratic Party. The Polish-German writer and revolutionary founded, with Karl Liebknecht, the Spartacist League, which became the Communist Party of Germany (Photo © DeA Picture Library).

*Plate 3*  On the streets of New York City following the stock market crash of October 1929, a man tries to sell his automobile. The collapse of Wall Street sent shockwaves through the entire world (Photo © Bettmann/Corbis).



*Plate 4*  On 7 December 1941, the Japanese launched a surprise attack on the headquarters of the US Pacific Fleet in Pearl Harbor, Hawaii, killing some 2,400 people, damaging 21 ships and disabling over 300 aircraft. The assault prompted US entry into the Second World War (Photo © Sipa Press).



*Plate 5*  In 1921, the Cossack military commander Reza Khan (*centre*) seized power in Persia (later Iran) in a coup. He was proclaimed Shah in 1925 but was forced to abdicate during the Second World War (Photo © Bettmann/Corbis).

*Plate 6*  Spanish-born artist Pablo Picasso in his studio at Vallauris, France, where he lived from 1948 to 1955 (Photo © DeA Picture Library).



*Plate 7*  The African-American jazz trumpeter Dizzy Gillespie, 1986. Gillespie was one of the leading proponents of bebop, a musical style employing rapid tempos and complex improvisational techniques, developed in the 1940s (Photo © William Coupon).



*Plate 8*  Charlie Chaplin in *Modern Times* (1936), a film critiquing modern working conditions. Set in a large factory, the film depicts Chaplin's celebrated Little Tramp struggling to survive in the advanced, industrialized world (Photo © Bettmann/ Corbis).



*Plate 9*  Greta Garbo in her role as *Mata Hari* (1931). Hollywood owed much of its early success to immigrants like the Swedish-born star and others including Charlie Chaplin, Fritz Lang and Ernst Lubitsch (Photo © Sipa-Press).

*Plate 10* Exterior view of Notre-Dame-du-Haut Chapel, Ronchamp, France, designed by Le Corbusier and begun in 1950. Le Corbusier was one of the most influential pioneers of modern architecture (Photo © Archivo Iconografico, S.A./ Corbis).



*Plate 11* The 39-storey Secretariat building, part of the United Nations Headquarters in New York City, designed by Wallace Harrison with Le Corbusier and others. The UN, the largest and most representative international organization in the modern world, was founded in San Francisco in 1945 (Photo © DeA Picture Library).

*Plate 12*    A meeting of members of the North Atlantic Treaty Organization (NATO), Paris, December 1957. This international organization was founded on 4 April, 1949 to ensure a system of defence against the USSR and its allies (Photo © Bettmann/Corbis).



*Plate 13*    Patrice Lumumba, the first prime minister of the Democratic Republic of the Congo, following its independence from Belgium in June 1960. Sésé Sekoin Mobutu forced him from office soon after in a coup. He was assassinated in January 1961 (Photo © DeA Picture Library).
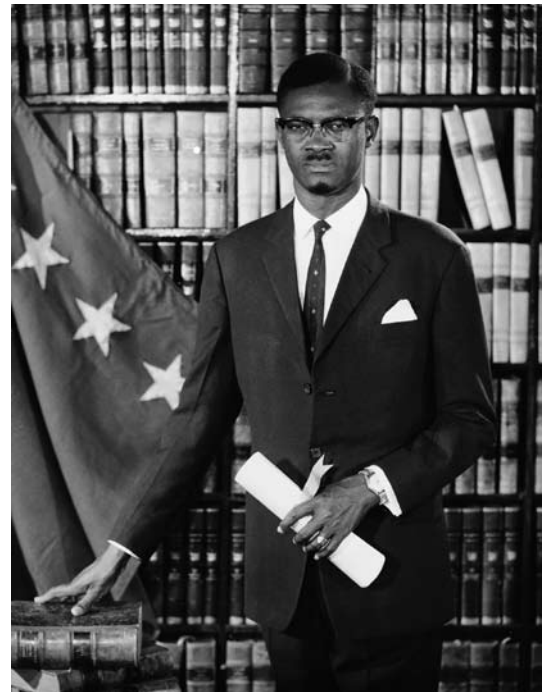


*Plate 14*    Anti-apartheid activist Nelson Mandela leaving prison in 1990, after nearly 28 years. In 1993, he and South African President F. W. de Klerk shared the Nobel Peace Prize for their efforts towards racial equality. Mandela was elected president of South Africa in 1994 (Photo © Kuus/Sipa-Press).

*Plate 15*    Egyptian President Anwar Sadat, US President Jimmy Carter and Israeli Prime Minister Menachem Begin on 17 September 1978 in Washington DC, at the signing of the Camp David Accords (Photo © Wally McNamee).



*Plate 16*    The first Palestinian *intifada* (Arabic for 'uprising') began in 1987 as violent civil protest against Israeli occupation of the Gaza Strip and the West Bank. Pictured here, a confrontation in Bethlehem in 1988 (Photo © Tiktiner/Sipa-Press).



*Plate 17*    On 9 November 1989, the Berlin Wall, a 49-km-long barrier constructed in 1961 to prevent residents of communist East Germany from defecting to free West Berlin, was opened to unrestricted transit. Soon after, this potent symbol of the Cold War was dismantled (Photo © Jacques Witt/Sipa-Press).

*Plate 18*    In 1993, Wayne Knox, of the Bell Laboratories, created a fiber-optic system capable of transmitting a laser beam (Photo © Roger Ressmeyer).
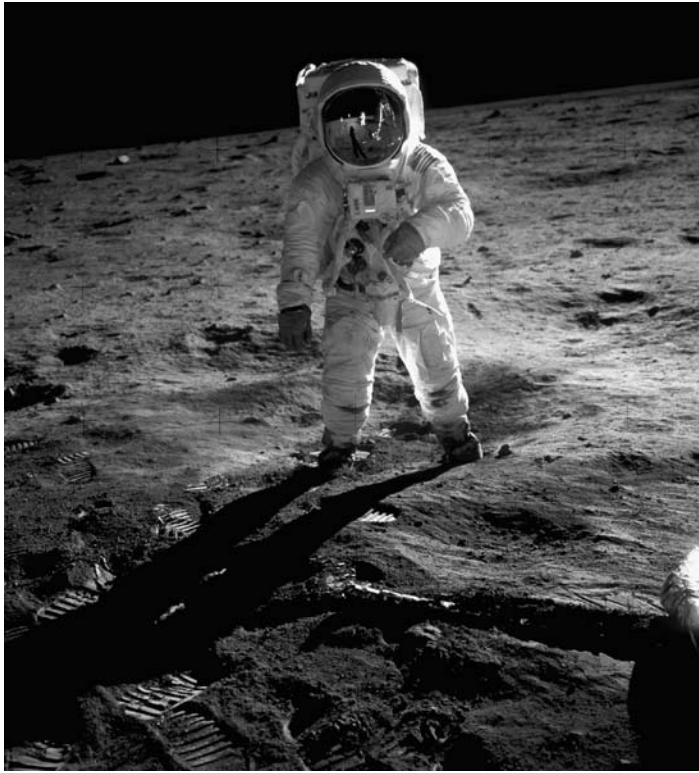


*Plate 19*    US astronaut Edwin 'Buzz' Aldrin Photographed on the Moon by Neil Armstrong on 21 July 1969, during the first human lunar landing, *Apollo 11* (Photo © Neil Armstrong).

*Plate 20*    Since the launch of *Sputnik I* in 1957, space has become an expanding venue for technological development. Orbiting satellites are the most ubiquitous symbol of this progress (Photo © DeA Picture Library).
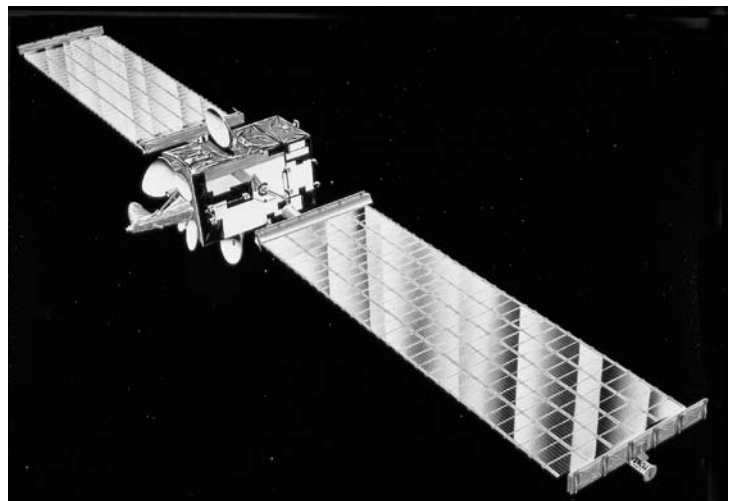




*Plate 21*    One of the earliest British television sets from 1949. While the first long-distance public broadcast occurred in 1927, television only gained broad popularity during the 1950s (Photo © DeA Picture Library).

*Plate* 22 An Italian illustration depicting the assassination of Archduke Franz Ferdinand, heir to the Austro-Hungarian throne, in Sarajevo on 28 June 1914 by Serbian student Gavrilo Princip, which precipitated the crisis leading to the First World War (Photo © DeA Picture Library).
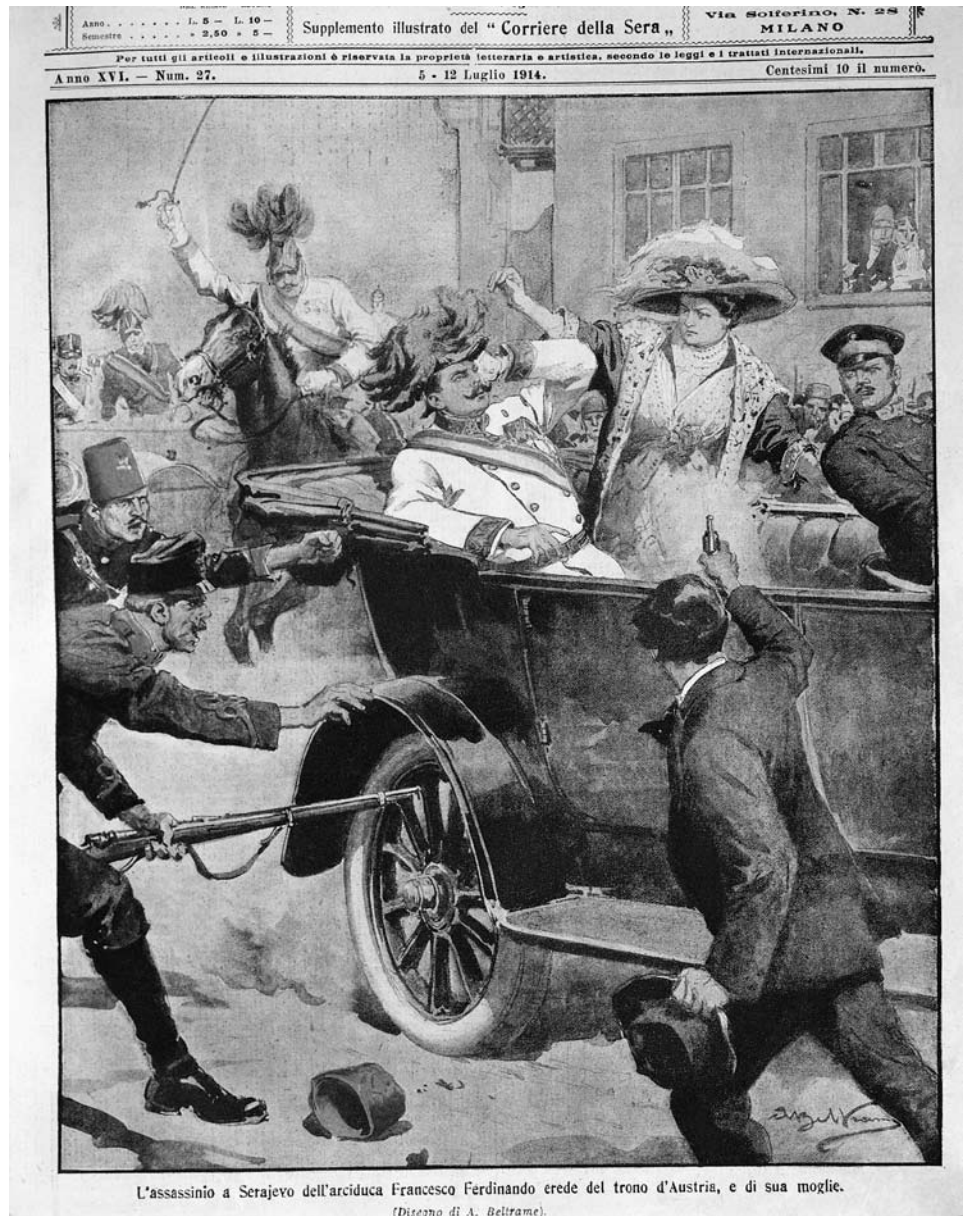


*Plate* 23 Indian nationalist leader Mohandas Karamchand Gandhi introduced a new style of political action based on non-violent civil disobedience, laying the groundwork for India's independence from Britain in 1947 (Photo © Bettmann/Corbis).

*Plate 24*  The Fascists' March on Rome, 28 October 1922. Spearheaded by Benito Mussolini (*centre*), founder of the Italian Fascist movement, this event led to his appointment as prime minister. Soon after, he declared himself dictator (Photo © DeA Picture Library).



*Plate 25*  Prisoners forced to labour in a Nazi concentration camp in Oranienburg, north of Berlin, during the Second World War. Hitler came to power in late January 1933 and established the first such camps only two months later (Photo © DeA Picture Library).

Plate 26   National Socialism, a German political movement based on nationalism, anti-communism, xenophobia and anti-Semitism, installed Adolf Hitler in 1933. Hitler's 'final solution' involved the systematic deportation and extermination of European Jews during the Second World War (Photo © DeA Picture Library).

Plate 27   Chinese soldiers of Chiang Kai-shek's Nationalist regime. He became leader of the unified Republic of China in 1928. During the Chinese Civil War (1926–49), he tried to eradicate communist opposition but failed, retreating to Taiwan (Photo © DeA Picture Library).





Plate 28   Japanese Emperor Hirohito ascended to the throne in 1926 and reigned until 1989. Here, he dons traditional attvire as part of his investiture as emperor (Photo © Bettmann/Corbis).

*Plate* 29　Adolf Hitler in Dortmund, Germany. In March 1936, the dictator reoccupied the demilitarized zone in Rhineland, near Dortmund, violating the Treaty of Versailles, which ended the First World War (Photo © Hulton-Deutsch Collection/Corbis).



*Plate* 30　Spanish general and dictator Francisco Franco during the Spanish Civil War (1936–39), which he won with the aid of Nazi Germany and Fascist Italy. In 1947, he declared Spain a monarchy and himself regent, maintaining power until his death in 1975 (Photo © DeA Picture Library).



*Plate* 31　German troops entering Warsaw, 1 September 1939. France and Great Britain declared war on Germany, two days after the Nazi invasion of Poland, officially beginning the Second World War (Photo © DeA Picture Library).

*Plate 32* Recently elected French President Charles de Gaulle visiting Algeria in 1958. De Gaulle came out of retirement to deal with the crisis surrounding the independence movement in the French colony, which continued until 1962 (Photo © DeA Picture Library).



*Plate 33* At the Yalta Conference, in the Crimea, in February 1945, Churchill, Roosevelt and Stalin defined the new European order in view of the imminent end of the the Second World War. Their decisions, including the division of Germany into four occupied zones, gave rise to the Cold War (Photo © DeA Picture Library).

*Plate 34*    Members of the East German *Freie Deutsche Jugend* (Free German Youth) demonstrating in 1950 in East Berlin against the US programme of European reconstruction, known as the Marshall Plan (Photo © Hulton Archive).



*Plate 35*    Soviet President Nikita Khrushchev and US President John F. Kennedy in Vienna in June 1961. Two months later, the Berlin Wall was erected, dividing the city until 1989 (Photo © DeA Picture Library).

*Plate 36*    Anti-Soviet demonstration in Prague, 1968. Under Alexander Dubček's leadership, political liberalization took hold in the Czech capital in the first months of 1968. Known as the Prague Spring, it came to an abrupt end when the USSR invaded (Photo © DeA Picture Library).

*Plate 37*　In 1985, Soviet leader Mikhail Gorbachev initiated a radical programme of economic and social reform, with *glasnost* (openness) and *perestroika* (restructuring) at its centre. He was awarded the Nobel Peace Prize in 1990 (Photo © A.P.N./Sipa-Press).



*Plate 38*　Samuel Nujoma during Namibia's independence ceremony in 1990. As Leader of the South West African People's Organisation (SWAPO), he led the battle against the occupying South African regime. In 1989, he was elected Namibia's first president (Photo © Laif/Sipa-Press).
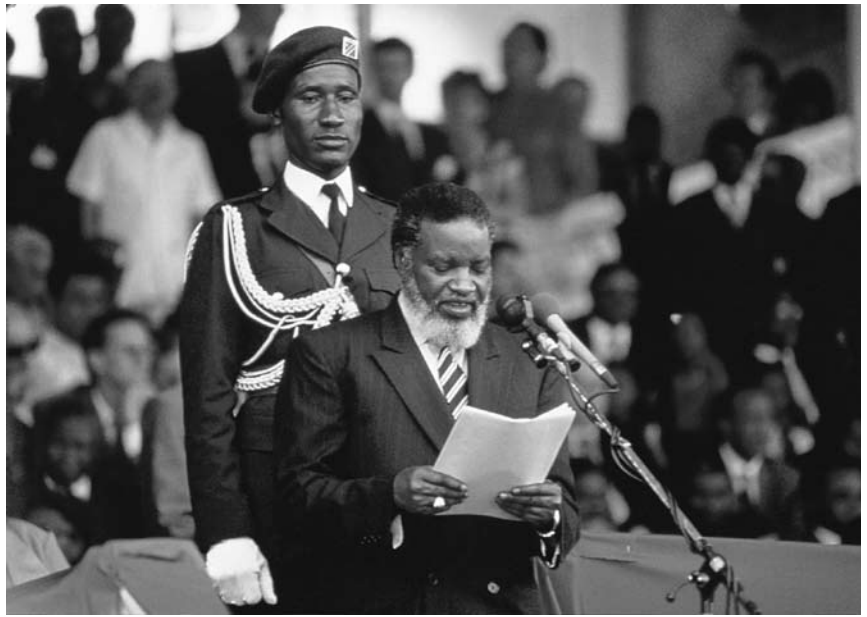


*Plate 39*　Propaganda poster showing Mao Zedong, Shanghai, 1967. Architect of the People's Republic of China, he came to power in 1949 and launched the Cultural Revolution in 1966, during which revolutionary attitudes were encouraged, officials dismissed, and all aspects of culture destroyed (Photo © DeA Picture Library).

Plate 41    Jawaharlal Nehru became the first prime minister of India in 1947, following its independence from Great Britain (Photo © Baron).

Plate 40    Achmed Sukarno founded the Indonesian Nationalist Party in 1927 and led the country's struggle for independence from the Netherlands in 1949. He was deposed in 1965, during a bloody military coup (Photo © DeA Picture Library).



Plate 42    Yugoslav leader Josep Broz Tito, Indian Prime Minister Indira Gandhi and Egyptian President Gamal Abdel Nasser, in the late 1960s. India, Egypt and Yugoslavia formed part of the original Non-Aligned Movement, founded in 1961 to foster closer political, economic and cultural cooperation in developing countries (Photo © DeA Picture Library).

Plate 43 African-American minister Martin Luther King, during the 1963 march on Washington DC, where he delivered his 'I Have a Dream' oration. King championed civil rights through non-violent protest. In 1964, he received the Nobel Peace Prize. His assassination in 1968 provoked racial unrest across the US (Photo © Bettmann/Corbis).



Plate 44 Apartheid, meaning separation, was a system of racial segregation instituted by South Africa's white minority government in 1948. Signs like the one in this 1956 photograph were common until apartheid was formally abolished in 1990 (Photo © Hulton Archive).

*Plate 45* Child soldiers in Sudan, in 1971, during that country's civil war (1956–72). As many as 15,000 child soldiers may have participated in the conflict (Photo © Hulton Archive).



*Plate 46* Shantytown on the River Saigon in Ho Chi Minh City, Viet Nam. Population growth in developing countries has resulted in poverty-stricken urban neighbourhoods, such as this one (Photo © Owen Franken).



*Plate 47* Pakistani immigrant on arrival at London's Gatwick Airport. Immigrants from former British colonies have tended to relocate to Anglo-Saxon countries, where they have some knowledge of language and customs (Photo © Hulton Archive).

*Plate 48*  Festivities surrounding the meeting of the Organization of African Unity (OAU), Freetown, Sierre Leone, 1980. Founded in 1963, the OAU advocates solidarity among African nations, fosters decolonization and promotes economic development (Photo © Corbis).



*Plate 50*  The birth of Dolly the sheep in 1996, the first mammal cloned from an adult cell, heralded a scientific revolution as well as controversy regarding the potential for cloning of a human being (Photo © Najlah Feanny-Hicks).
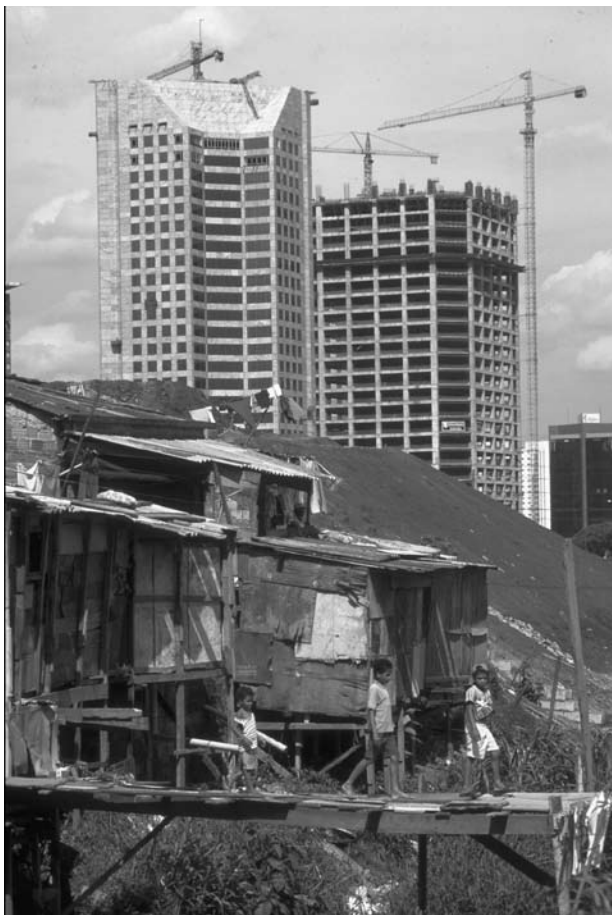
*Plate 49*  Uneasy neighbours: luxury and squalor in a modern metropolis. Huge population increases have forced even advanced developing countries to grapple with extreme urban poverty in the face of economic prosperity (Photo © Paulo Fridman).

*Plate 51*    Female firefighters quelling a blaze after the Japanese attack at Pearl Harbor, 1941. Throughout the Second World War, US women were indispensable on the homefront and abroad (Photo © Hulton Archive).



*Plate 52*    Afghan Muslim women sporting a full *burqa*, 1997. Under the Taliban regime, a Sunni sect that ruled Afghanistan from 1996 to 2001, Muslim women were required to cover their entire bodies in public (Photo © Christine Spengler/Sipa-Press).

*Plate 53* Burmese opposition leader Aung San Suu Kyi was awarded the 1991 Nobel Peace Prize, while under house arrest (1989–95) for her efforts to bring democracy to Burma (now Myanmar). Here, she addresses supporters following her release in 1995 (Photo © Manuel Ceneta/AFP).



*Plate 54* English suffragettes during a demonstration in London, 1911. Women's suffrage, granted in the UK in 1928, was often the first step in an ongoing process towards full political, legal, socio-cultural and economic equality (Photo © Hulton-Deutsch Collection/ Corbis).



*Plate 55* Eritrean women waiting to cast ballots in a national referendum held in April 1993 on their country's independence from Ethiopia. The vote brought an end to a thirty-year civil war (Photo © Robert Papstein/ Sipa-Press).

*Plate 56* Golda Meir in 1948, preparing a speech during festivities marking the establishment of the State of Israel. She served as the country's fourth prime minister (1969–74) (Photo © Sipa-Press).



*Plate 57* The Beatles proudly display medals of the Order of the British Empire presented to them by Queen Elizabeth II in 1965. The renowned British rock group embodied the new youth culture (Photo © Bettmann/Corbis).



*Plate 58* Rue Gay Lussac, Paris, May 1968, in the aftermath of student protests. Such insurrections led to the recognition of modern youth as both a political and cultural force (Photo © Bettmann/Corbis).

*Plate 59*    Concertgoers at Woodstock '94, Bethel, New York, a rock concert commemorating the twenty-fifth anniversary of the legendary original gathering in 1969, which represented the culmination of youth and hippie counterculture (Photo © Henry Diltz).
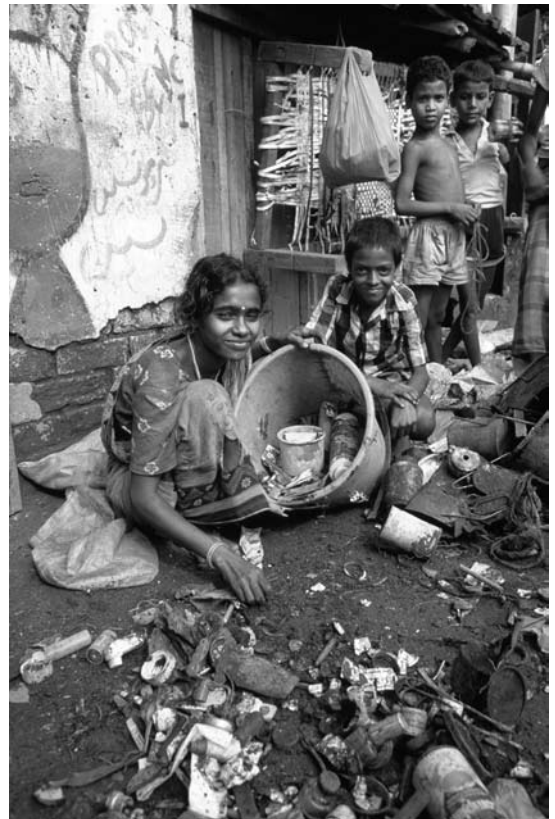


*Plate 60*    Children on a street in Calcutta, India. Economic hardships in developing countries have fueled the exploitation of child labour, a subject of concern for human rights advocates (Photo © Nazima Kowall).



*Plate 61*    An elderly Chinese woman holding her grandson. In Chinese culture, senior citizens are greatly respected and venerated for their wisdom and experience (Photo © Paul A. Souders).

*Plate 62*    An older Korean woman dressing a girl in preparation for a shamanistic ritual. The elderly are vital to the transmission of social, cultural and religious customs to younger generations (Photo © Nevada Wier).

*Plate 63*    Rehabilitation centre in Sierra Leone, financed by
Médecins Sans Frontières and Handicap International, two
French aid agencies devoted to humanitarian causes
(Photo © Patrick Robert).



*Plate 64*    French Paralympic swimming champion Béatrice Hess. The evolution of social
attitudes and legal statutes have increased the presence of persons with disabilities in many
sectors of contemporary society (Photo © Pascal Le Segretain).

*Plate 65* Sisal fibres drying in the United Republic of Tanzania. Modern agricultural methods have increasingly made environmentally friendly cultivation possible (Photo © Paul Almasy).

*Plate 66* Women working in a rice growing cooperative in Mozambique. The search for models of sustainable development, which promote the preservation of natural resources, has led to a revival of traditional customs (Photo © Adrian Arbib).





*Plate 67* Elaborately adorned Masai youth in East Africa at a traditional ceremony (Photo © Yann Arthus-Bertrand).

*Plate 68*   Physicists Max Planck and Albert Einstein during a conference in Berlin, 1930 (Photo © Bettmann/Corbis).



*Plate 69*   German physicist and mathematician Max Born won the 1954 Nobel Prize in Physics for his research in quantum mechanics (Photo © Hulton-Deutsch Collection/Corbis).



*Plate 70*   British scientist Paul Dirac, father of quantum physics, received the 1933 Nobel Prize in Physics 'for the discovery of new productive forms of atomic theory' (Photo © Bettmann/Corbis).

*Plate 71*  Nuclear particle accelerator at the European Organization for Nuclear Research (CERN), near Geneva, Switzerland. This instrument uses electric fields to propel charged particles to great energies (Photo © Marc Garanger).



*Plate 72*  US astronomer Edwin Hubble is credited with discovering the redshift of galaxies, an effect produced by changes in light's wavelength. Hubble's law, a velocity-distance relation, led to the concept of the expanding universe (Photo © Bettmann/Corbis).



*Plate 73*  Mainframe computers were first produced in the late 1950s and laid the groundwork for personal computers and the proliferation of information technology, beginning in the 1980s (Photo © Royalty-Free/Corbis).
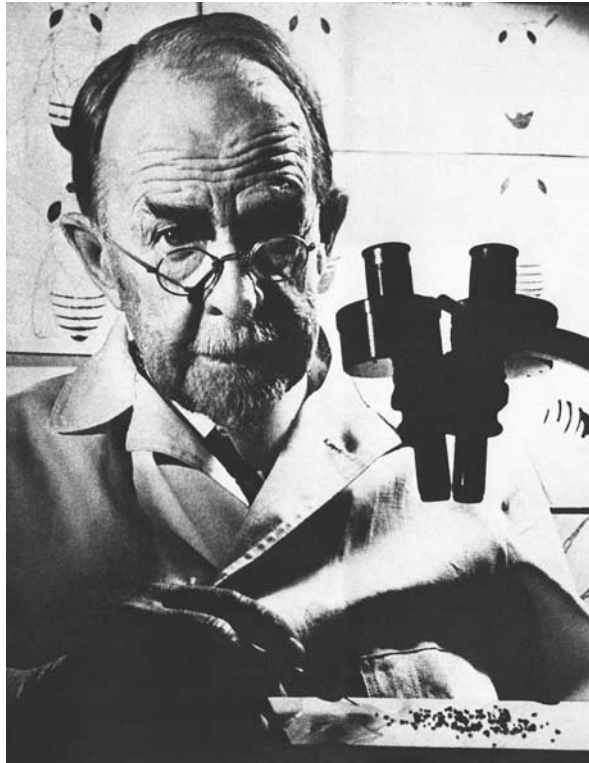
*Plate 74*    US geneticist Thomas Hunt Morgan won the 1933 Nobel Prize in Medicine or Physiology for proving that chromosomes are the carriers of genes, thus uncovering the mystery of heredity (Photo © Bettmann/Corbis).



*Plate 75*    US biologist Craig Venter is known for his groundbreaking research in mapping the human genome, which required the sequencing of 3 billion DNA bases (Photo © Trippett/ Sipa-Press).

Plate 76    Founded in 1864, the International Red Cross and Red Crescent Movement, or Red Cross, is one of the world's largest humanitarian organizations. Initially, only the red cross was employed as its symbol. Certain Muslim nations objected, however, and the red crescent was adopted (Photo © Barnabas Bosshart).
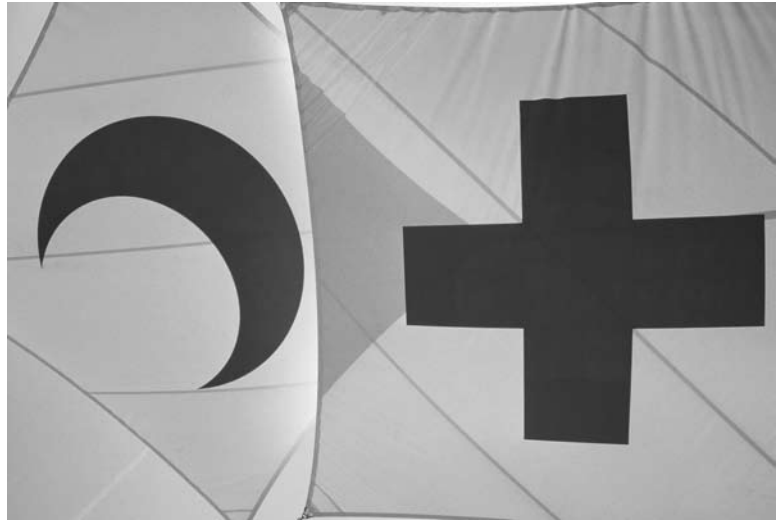


Plate 77    Preparation of an anti-cholera vaccine. To combat the epidemic, which broke out in Egypt in 1947, more than 56,000 doses of vaccine were ordered (Photo © Bettmann/Corbis).



Plate 78    US biologist Jonas Salk preparing the polio vaccine in the early 1950s, one of the first successful attempts at immunization against a virus. Initial large-scale vaccination programmes against the disease began in the USA in 1954 (Photo © Bettmann/Corbis).

*Plate 79*    Preparation of antibiotics, 1956. Beginning in the 1940s, commercial production of antibiotics eradicated numerous infectious diseases, although high costs meant only certain nations could take advantage of them (Photo © Hulton-Deutsch Collection/Corbis).



*Plate 80*    Domestic washing machine, late 1940s. Following the Second World War, the introduction of washing machines into domestic households ensured greater physical hygiene (Photo © Severn).



*Plate 81*    US family planning advertisement, Planned Parenthood, 1967. The increasing availability of female contraceptives in the 1960s ignited moral and political debates (Photo © Hulton-Deutsch Collection/ Corbis).

*Plate 82*  A doctor vaccinates an African girl, 1979. The World Health Organization (WHO), an agency of the UN, was established in 1948 to combat endemic diseases in developing countries (Photo © Hulton Archive).



*Plate 83*  Model of the exterior of the Human Immunodeficiency Virus (HIV), the virus responsible for Acquired Immune Deficiency Syndrome (AIDS). By the end of the twentieth century nearly 70 per cent of the 40 million people living with AIDS resided in sub-Saharan Africa (Photo © Michael Freeman).
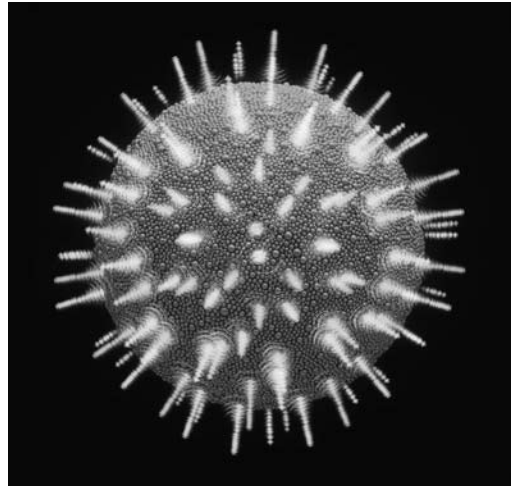


*Plate 84*  Dispensing traditional medicine in Manali, India. Despite advances in Western science, ancient healing rituals and rites persist and flourish around the world (Photo © Lindsay Hebberd).
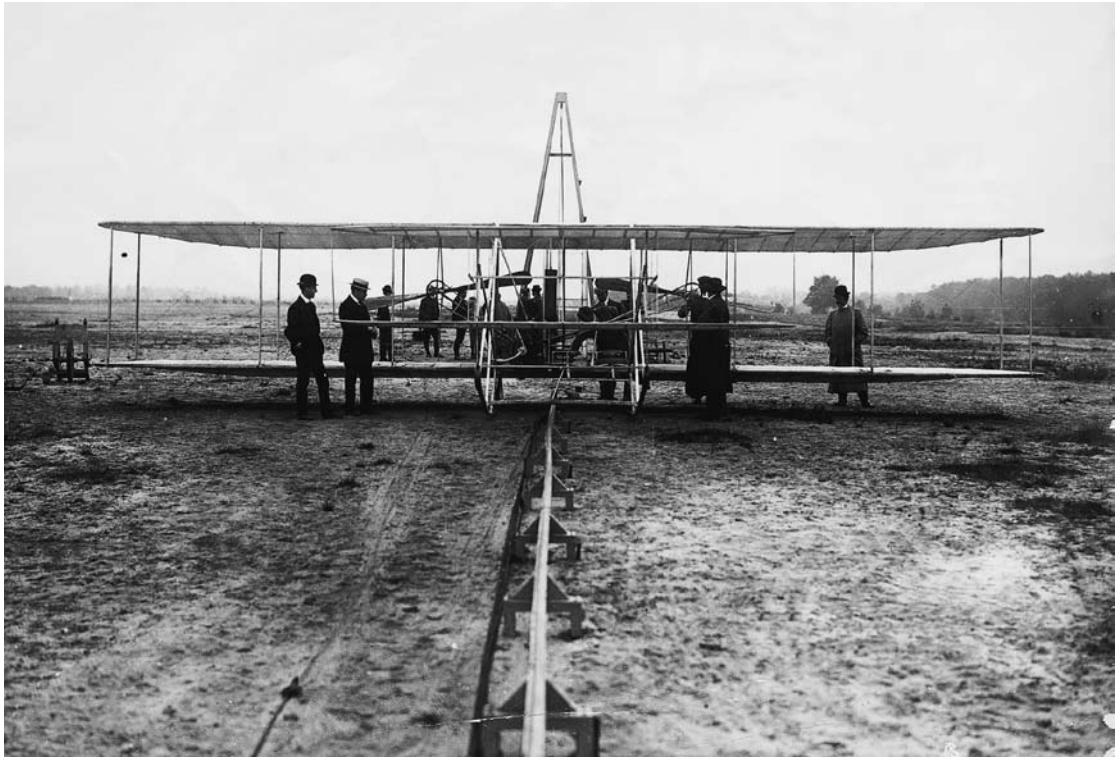
*Plate 85*    On 17 December 1903, Orville and Wilbur Wright took the first successful flight in an airplane. They received a patent for their design and construction in 1906, paving the way for the aviation industry (Photo © DeA Picture Library).



*Plate 86*    Throughout the twentieth century, whale hunting threatened the extinction of the species and precipitated widespread opposition (Photo © DeA Picture Library).

*Plate 87*　Wall-mounted German telephone designed by Siemens and Halske, c. 1927. The telephone revolutionized communication and foreshadowed globalization (Photo © DeA Picture Library).



*Plate 88*　On 12 April 1961, Soviet cosmonaut Yuri A. Gagarin became the first human to travel into space, completing a single orbit of the Earth aboard *Vostok I* (Photo © DeA Picture Library).
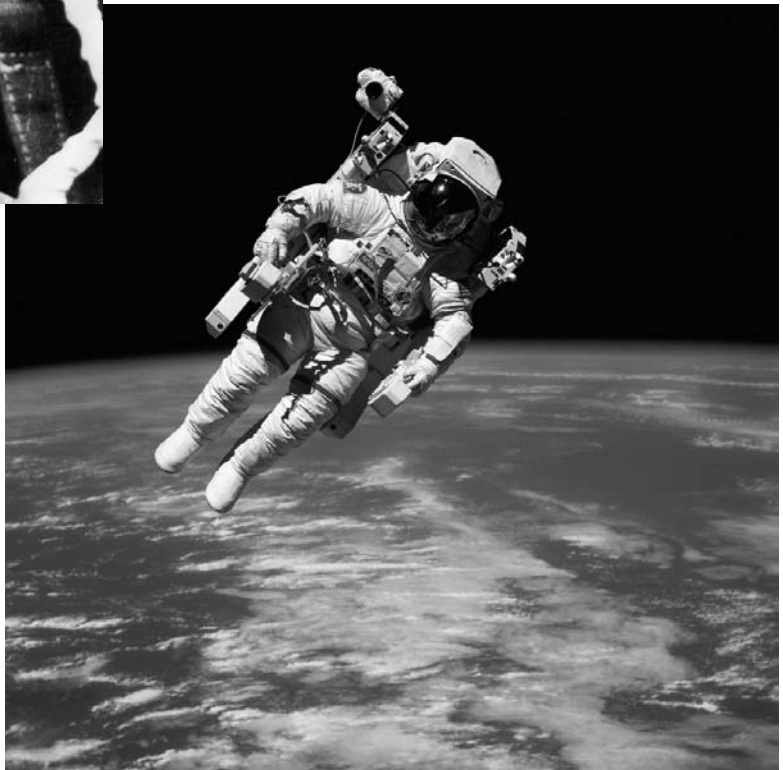


*Plate 89*　US astronaut Bruce McCandless on 3 February 1984, performing the first untethered space walk, from the shuttle *Challenger* (Original image courtesy of NASA).

*Plate 90*  On 6 February 1995, the US shuttle *Discovery* attempted to dock with *Mir*, the Russian space station, heralding a new era of US-Russian cooperation in space exploration (Photo © ITAR TASS/Sipa-Press).



*Plate 91*  The 88-storey Petronas Twin Towers (1988) in Kuala Lumpur, Malaysia, were designed by Italian architect Cesar Pelli. Indigenous waste and recycled materials were utilized in their construction (Photo © John Dakers).



*Plate 92*  Centrale Solare Eurelios, an experimental solar power plant outside Adrano, Sicily. The continual rise in energy consumption has made the search for renewable forms increasingly important (Photo © DeA Picture Library).

*Plate 93*　A wind farm in Hurghada, Egypt. Like solar power, wind is an environmentally friendly, renewable energy source (Photo © DeA Picture Library).



*Plate 94*　A crude-oil loading bay in Kuwait, a member of the Organization of the Petroleum Exporting Countries (OPEC). The 11 nations comprising OPEC hold about two-thirds of the world's oil reserves. They supply 40 per cent of the world's oil production and half of the exports (Photo © DeA Picture Library).



*Plate 95*　Nuclear power station in Didcot, UK. In 1956, the world's first large-scale commercial reactor generating electrical power began operating in Calder Hall, UK (Photo © DeA Picture Library).

*Plate 96*   Polish-born British anthropologist Bronislaw Malinowski achieved recognition for his theory of reciprocity, based on pioneering ethnographic fieldwork in Papua New Guinea (Photo © Hulton-Deutsch Collection/Corbis).
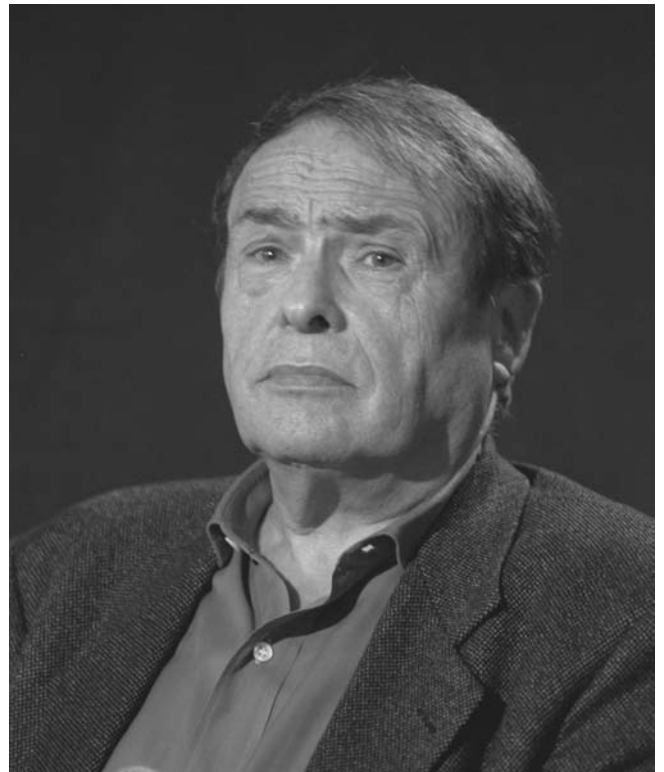


*Plate 97*   French sociologist and anthropologist Pierre Bourdieu, whose work addressed social patterns of power as well as individual and group behaviour, inventing concepts such as social and cultural capital (Photo © Alain Nogues).



*Plate 98*   French pioneer of modern sociology Emile Durkheim. He advocated that the methods of natural science be applied to the study of society (Photo © Bettmann/Corbis).



*Plate 99*   With Durkheim, the German Max Weber founded the field of modern sociology. His pioneering work on religion argued that it explained, in part, differences in the development of Eastern and Western cultures (Photo © Bettmann/Corbis).

*Plate 100*    British economist John Maynard Keynes (centre) during a UN conference. His work, the basis for macroeconomics, advocated governmental intervention to spark employment and economic prosperity (Photo © Hulton Archive).



*Plate 101*    German defendants at the Nuremberg Trials, legal proceedings against Nazis accused of war crimes following the Second World War. Judges from the USA, UK, France and Soviet Union presided over the military tribunals held in Nuremberg, Germany, from 1945 to 1948 (Photo © Corbis).
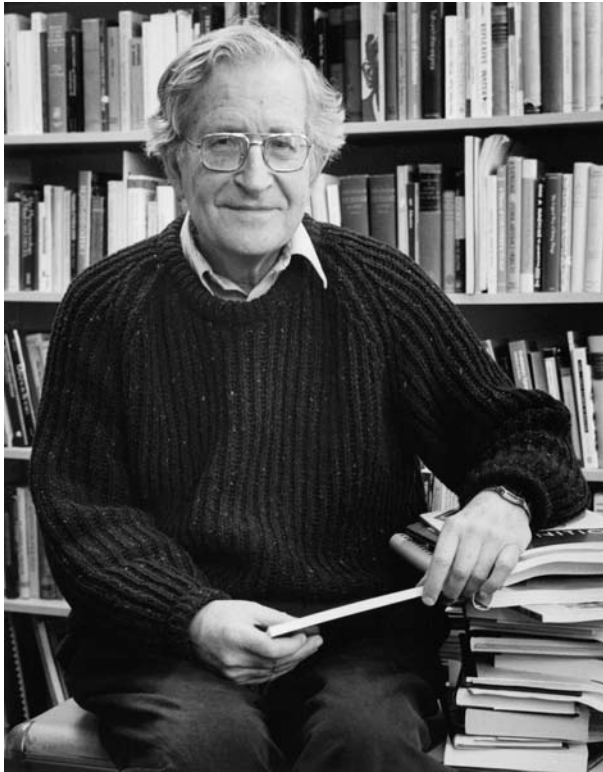
*Plate 102*    US linguist Noam Chomsky, creator of the Chomsky hierarchy, a classification system of formal languages introduced in the 1950s that revolutionized contemporary linguistics (Photo © Christopher Felver).
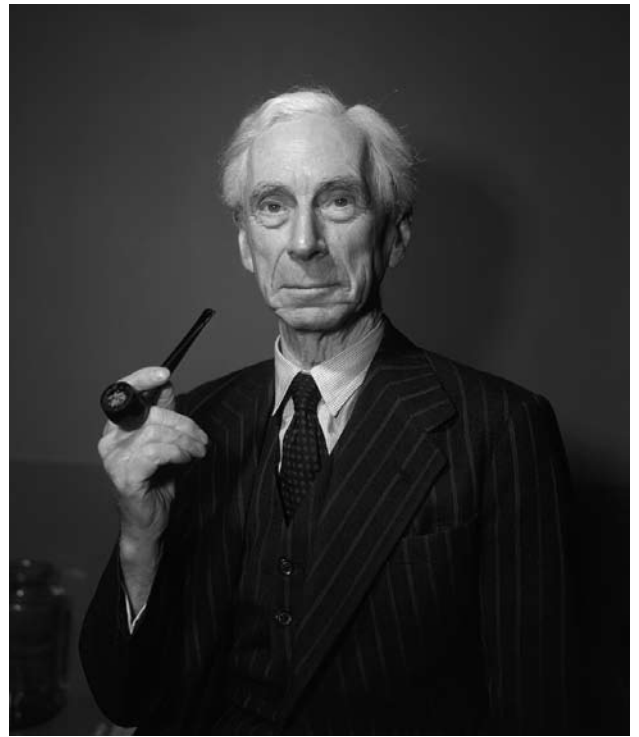
*Plate 103*    British philosopher and political activist Bertrand Russell. His contributions to philosophy were in the areas of mathematics and logic. An ardent liberal, he promoted nuclear disarmament and criticized the Vietnam War (Photo © Bettmann/Corbis).



*Plate 104*    French philosopher and writer Jean-Paul Sartre was one of the principal exponents of existentialism, a philosophical movement emphasizing the individual and individual experience (Photo © Genevieve Naylor).

*Plate 105*  French anthropologist Claude Lévi-Strauss employed structuralism, the exploration of the inter-relationships through which meaning is produced, as a means of understanding human culture and society (Photo © Sophie Bassouls).
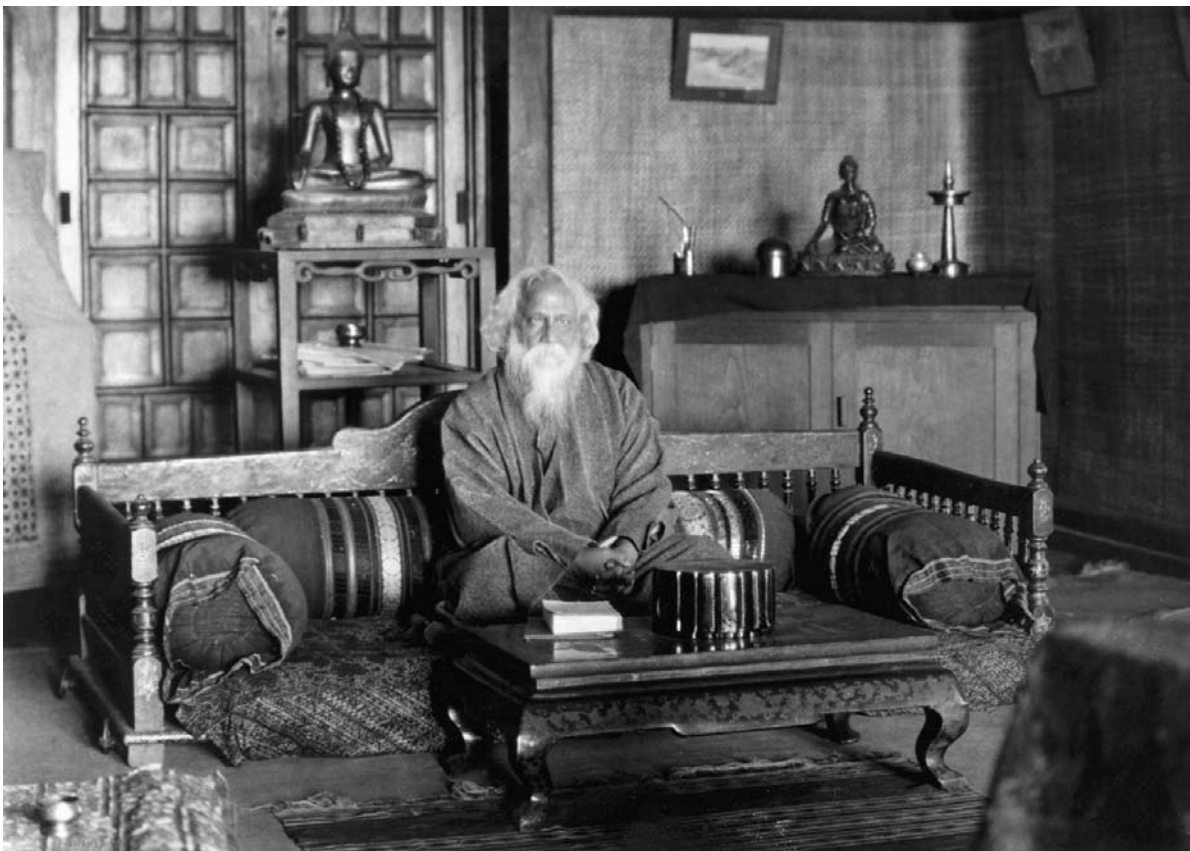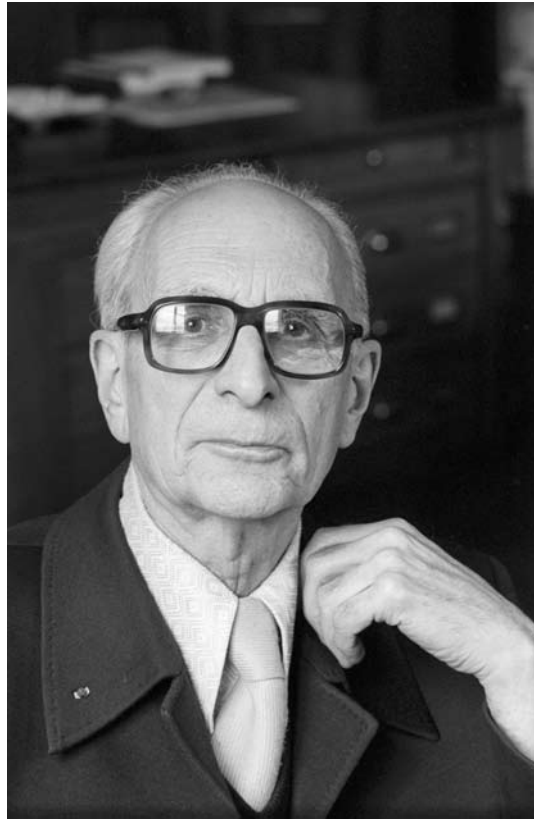


*Plate 106*  Indian poet and philosopher Rabindranath Tagore was awarded the 1913 Nobel Prize in Literature, making him the first Asian to receive the honour (Photo © E. O. Hoppe).

*Plate 107*    Mausoleum of Chinese leader Sun Yat-sen, Nanjing, China. His political philosophy, outlined in 1905 and known as Three Principles of the People, included the concepts of nationalism, democracy and prosperity (Photo © Keren Su).



*Plate 108*    Japanese philosopher Nishida Kitaro dubbed this locale, which he passed through regularly, the Pathway of the Philosophers. Kitaro assimilated European philosophical tenets with historical Japanese experience, expounding on concepts like 'place' (Photo © Macduff Everton).



*Plate 109*    Julius Nyerere, the first president of the United Republic of Tanzania (1964–85), adhered to a nationalist-ideological philosophy, claiming that ideological freedom and a return to traditional African humanism accompanied genuine independence (Photo © Liz Gilbert).

*Plate 110*    Mexican writer, philosopher and politician
José Vasconcelos, 1929. Supporter of the 1910
revolution, he created and ran the Ministry of Public
Education (1920–25) (Photo © Bettmann/Corbis).



*Plate 111*    The Greenpeace vessel *Rainbow Warrior*, sunk by the French secret service in 1985. Greenpeace,
an international environmental organization founded in 1971, has staged dramatic protests to draw attention to
ecological issues ranging from nuclear testing to whaling (Photo © Adrian Carroll).

*Plate 112*  A Muslim woman wearing a chador in Tehran, Iran, required dress under fundamentalist Islamic law. She walks past a poster of the Ayatollah Khomeini, spiritual and political leader of the 1979 Islamic revolution and advocate of fundamentalism (Photo © David Turnley).



*Plate 113*  Korean followers of neo-Confucianism during a ceremony commemorating the birth of Confucius. A return to traditional beliefs, rather than the adoption of Western values, has accompanied modernization in some Asian cultures (Photo © Nathan Benn).



*Plate 114*  A young Shinto nun. Shinto ('way of the Gods') is the natural religion of Japan. Many Japanese have adapted its ancient, polytheist practices and principles to modern urban life (Photo © Chris Rainier).

Plate 115  Nuns in San Salvador,
El Salvador, where Archbishop Oscar
Romero was assassinated in 1980.
Romero's advocacy for the poor and
victims of his country's civil war made
him a target for right-wing
paramilitary death squads
(Photo © Bettmann/Corbis).



Plate 116  Buddhist monk in Burma (now Myanmar),
where the ancient religion became associated with
nationalist movements (Photo © Jeremy Horner).



Plate 117  Young novices at the Gandan
monastery, Ulan Bator, Mongolia. During its close
association with the USSR, during much of the
twentieth century, the Mongolian Government
tried to eradicate local Buddhist practices
(Photo © Michel Setboun).

Plate 118    Indian holy men praying on the River Ganges. Thousands of Hindu pilgrims purify themselves in its waters during Kumbh Mela, an important religious festival celebrated every 12 years (Photo © Ludwig/ Sipa-Press).



Plate 119    A Jewish school in the ultra-orthodox Mea Shearim quarter in Jerusalem. The Arab-Israeli conflict has witnessed a rise in conservative religious practices among certain Israeli Jews. (Photo © Bojan Brecelj).



Plate 120    Muslims at the Dome of the Rock in Jerusalem at Ramadan, the ninth month of the Islamic year, during which Muslims fast. Islam has proven a fundamental factor in many social movements in certain Muslim countries (Photo © Richard T. Nowitz).

*Plate 121*    Pope John Paul II blessing a crowd in Zaire (now the Democratic Republic of the Congo), 1980. While supporting human rights and social justice, he remained fundamentally conservative on issues like women in the Church, contraception and sexual mores (Photo © Vittoriano Rastelli).



*Plate 122*    Commemoration of the fiftieth anniversary of the US atomic bomb attack of 6 August 1945 at the Hiroshima Peace Memorial (Photo © Qualyle-Orion/Sipa-Press).

Plate 123  Sperm samples used in *in vitro* fertilization. This controversial technique, in which egg cells are fertilized outside a woman's body, was developed in the UK, where the first so-called 'test-tube baby' was born in 1978 (Photo © Reserved Rights).
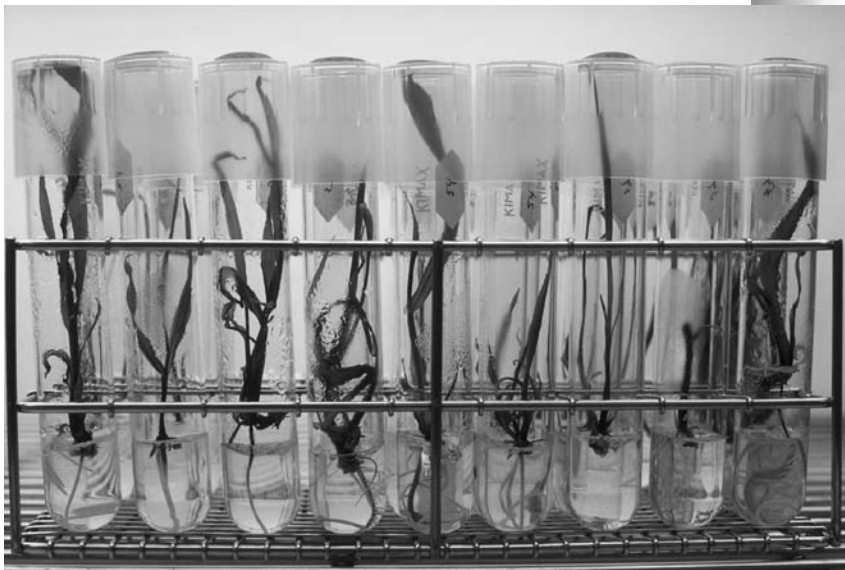




Plate 124  Genetically engineered maize cultivated in a laboratory in Palo Alto, California. Despite its role in fighting world hunger, genetic engineering of plants and animals continues to ignite debate, mainly due to possible secondary effects on humans (Photo © Lowell Georgia).



Plate 125  Convoy of the International Red Cross arriving in Kigali, Rwanda, 1993, with humanitarian aid for refugees who were victims of the ethnic wars in the region (Photo © Patrick Robert).

*Plate 126* Russian physiologist Ivan Pavlov received the 1904 Nobel Prize in Medicine or Physiology. He is best remembered for his experiments with dogs, which proved that an automatic conditioned reflex can be artificially induced (Photo © Bettmann/Corbis).
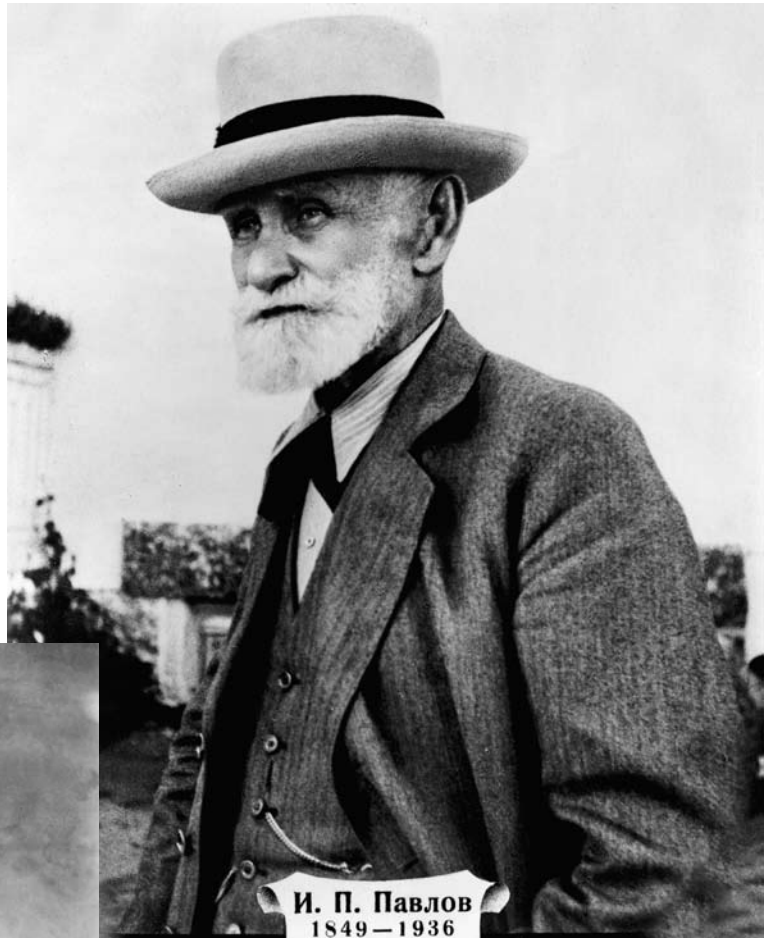


*Plate 127* Young Inuit woman, carrying her child on her back, 1903. Anthropological fieldwork conducted in the early twentieth century helped undermine popular, evolutionary paradigms employed to classify so-called 'primitive' cultures and indigenous peoples (Photo © Michael Maslan).



*Plate 128* The automobile assembly line, introduced by US industrialist Henry Ford in 1913, revolutionized labour techniques and initiated mass production (Photo © Bettmann/Corbis).

*Plate 129*    Performance of Japanese kabuki, a theatrical form first developed in the seventeenth century. In this popular genre, incorporating highly stylized mime, song and dance, men perform all the roles (Photo © Michael S. Yamashita).



*Plate 130*    A typesetter working on a linotype machine, 1970. First produced in 1886, the linotype machine, with its ninety-character keyboard, transformed the printing industry (Photo © Bettmann/Corbis).



*Plate 131*    US composer George Gershwin mixed elements of Jewish popular music with jazz and classical music. He and his brother, Ira, wrote several Broadway musical hits (Photo © Bettmann/Corbis).

Plate 132    Poets André Breton, Paul Eluard, Tristan Tzara and Benjamin Péret, 1932. During the First World War, Tzara founded dada, an aesthetic movement advocating anarchy and absurdity. From dada, emerged surrealism, a movement embracing the powers of the unconscious, of which Breton, Eluard and Péret were leading practitioners (Photo © Stefano Bianchetti).



Plate 133    Russian author Ivan Bunin (*seated, right*). In 1919, in the aftermath of the Russian Revolution, he immigrated to France. He became the first Russian to win the Nobel Prize in Literature (1933) (Photo © Michael Nicholson).



Plate 134    Irish-born writer Samuel Beckett settled in Paris in 1938, where he spent most of his adult life. In 1969, he received the Nobel Prize in Literature (Photo © Hulton Archive).

Plate 135    French writer Marguerite Yourcenar was celebrated for her historical novels, such as *Memoirs of Hadrian* (1951). In 1980, she was the first woman elected to the Académie Française (Photo © JP Laffont).
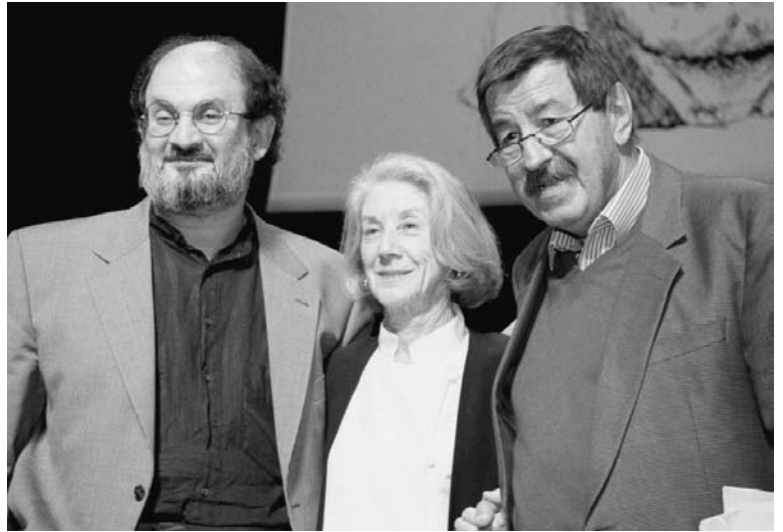


Plate 136    Indian-born UK author Salman Rushdie (*left*), South African writer Nadine Gordimer (*centre*) and German novelist Günter Grass (*right*), three icons of twentieth-century literature (Photo © Telepress/ Corbis Sygma).



Plate 137    US writer F. Scott Fitzgerald with his wife Zelda, and daughter. His work, most notably *The Great Gatsby* (1925), exposed the social and moral corruption during the 'jazz age' of the 1920s (Photo © Bettmann/Corbis).

Plate 138    US writer Arthur Miller and his wife, actress Marilyn Monroe, 1956. Miller's plays, including *Death of a Salesman* (1949) and *The Crucible* (1953), addressed morality and the societal and family pressures individuals endure (Photo © Corbis).

*Plate 139*    African-American author Richard Wright. In *Black Boy* (1945) and other novels, he examined the horrors of racial segregation and its effects on African Americans (Photo © Bettmann/Corbis).



*Plate 140*    Caribbean poet and playwright Derek Walcott was born in St Lucia. He received the 1992 Nobel Prize in Literature for his subtle portrayals of the history, geography and everyday life of the multiracial peoples living in the Caribbean (Photo © Brooks Kraft).



*Plate 141*    Argentine writer Jorge Luis Borges, one of the foremost contemporary Latin-American authors. In his poetry and short stories, he explored themes of time, reality and identity (Photo © Sophie Bassouls).
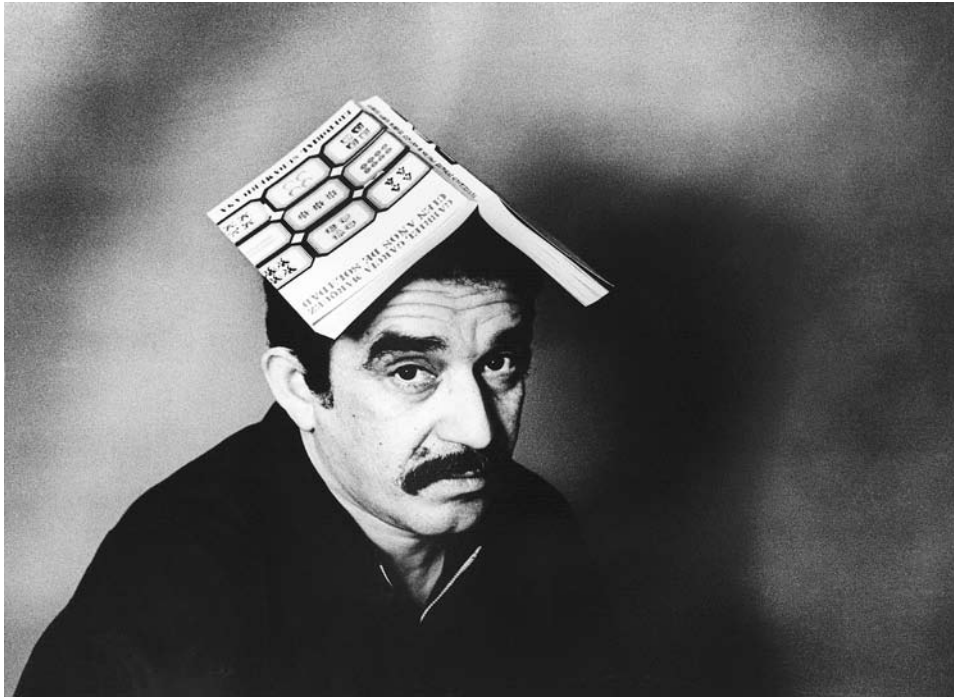
*Plate 142* Colombian writer Gabriel García Márquez with a copy of his most famous novel, *One Hundred Years of Solitude* (1967), on his head. He won the Nobel Prize in Literature in 1982 (Photo © Colita/Corbis).



*Plate 143* Nigerian writer Wole Soyinka (*left*) with a group of journalists. In 1986, he became the first African to be awarded the Nobel Prize in Literature (Photo © Jacques Langevin).



*Plate 144* Indian writer and anthropologist Amitav Ghosh. Considered one of the finest Indian authors working in the English language today, he published his first novel, *The Circle of Reason*, in 1986 (Photo © Sophie Bassouls).
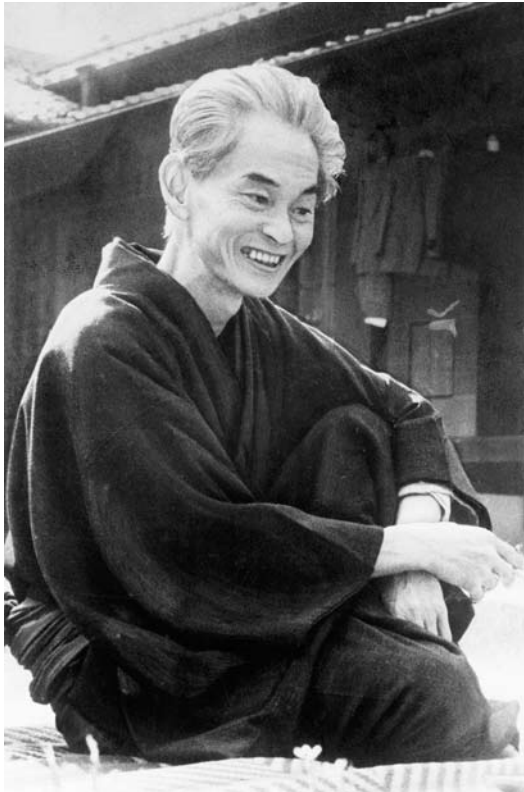
Plate 145    Japanese novelist Yasunari Kawabata. In 1968, he became the first Japanese writer to win the Nobel Prize in Literature, for novels such as *Snow Country* (1947) and *The Master of Go* (1956) (Photo © Bettmann/Corbis).



Plate 146    Bust of Lu Xun, considered the father of modern Chinese literature. His first major work, *A Madman's Diary*, inspired by Gogol's tale, was published in 1918 (Photo © John T. Young).



Plate 147    Pablo Picasso, *Les Demoiselles d'Avignon*, 1907, oil on canvas. A representation of female prostitutes, the faces of whom derive from African and Iberian sculpture, the painting heralded cubism and remains an icon of modernism (Photo Museum of Modern Art, New York. Lillie P. Bliss Bequest © 2004 Estate of Pablo Picasso/Artist Rights Society [ARS] New York).

Plate 148    Pablo Picasso, *Guitar* 1912, cardboard and string. This relief sculpture marked the transition from analytical to synthetic cubism. In his representation of space and volume using simple materials, Picasso revealed his ongoing dialogue with African sculpture (Photo Museum of Modern Art, New York, gift of the artist © 2004 Estate of Pablo Picasso/Artist Rights Society [ARS], New York).



Plate 149    Vladimir Tatlin, *The Sailor*, 1911–12, oil on canvas. In composition and technique, this early self-portrait suggests, in part, the influence of orthodox icons in the artist's native Ukraine (Image courtesy SCALA/Art Resource, New York © Estate of Vladimir Tatlin/Licensed by VAGA, New York).
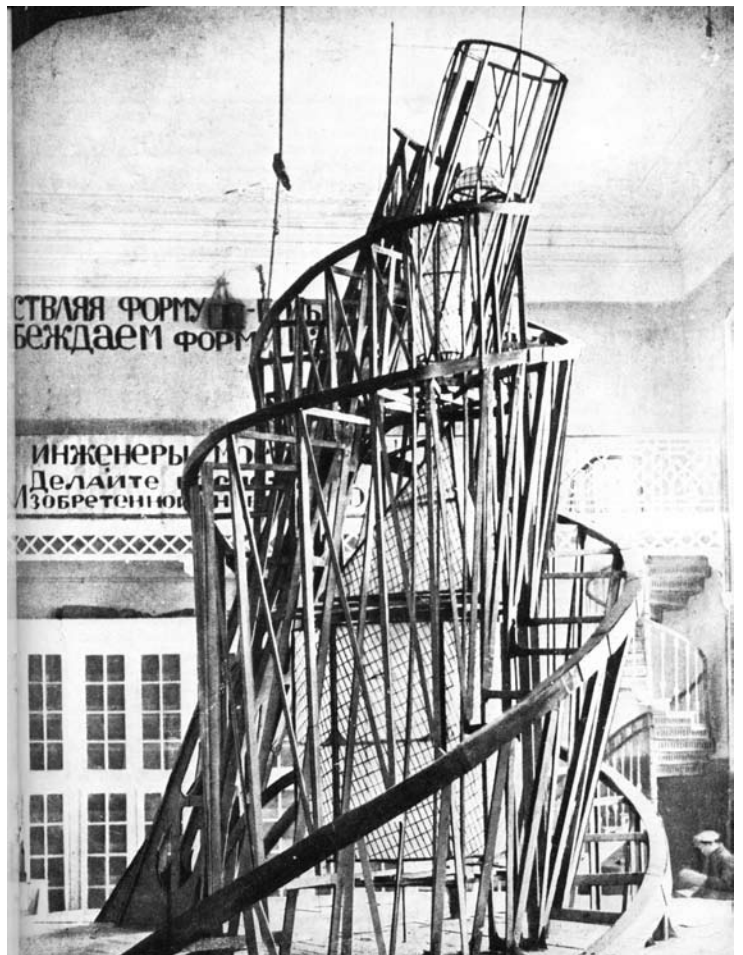


Plate 150    Vladimir Tatlin, model for *Monument to the Third International*, 1920, wood, cardboard, metal, wire, oil paper. Tatlin achieved fame for this visionary work of modernist architecture. In iron, glass and steel, it would have dwarfed the Eiffel Tower, had it been constructed (Photo © Estate of Vladimir Tatlin/Licensed by VAGA, New York).

*Plate 151*   Carlo Carrà, *Interventionist Demonstration*, 1914, tempera and collage on cardboard. Carrà was a leading figure in futurism, the Italian avant-garde movement that championed speed, technology and violence (Photo © 2004 Artist Rights Society [ARS], New York/SIAE, Rome).



*Plate 152*   Max Ernst, *Celebes* (*The Elephant Celebes*), 1921, oil on canvas. Named for the Indonesian island, which the artist had never visited, the painting presents an imaginary dream world (Photo © 2004 Artist Rights Society [ARS], New York/ADAGP, Paris).

*Plate 153*  View of the Exposition Internationale, Paris, 1937. Standing opposite one another are the German pavilion (*right*), designed by Hitler's architect Albert Speer, and the Soviet pavilion (*left*), on the roof of which stands a massive sculpture of a man and woman triumphantly joining hammer and sickle (Photo © courtesy the Getty Research Institute, Resource Collection: Exposition Postcard Collection Archive).



*Plate 154*  Pablo Picasso, *Guernica*, 1937, oil on canvas. The artist took as his subject the bombing of the Basque village of Guernica by the Nazis aiding Franco's regime. First exhibited at the 1937 Exposition Internationale, the mural remains a potent anti-fascist and anti-war symbol (Photo © 2004 Estate of Pablo Picasso/Artist Rights Society [ARS], New York).

Plate 155 Kazuo Shiraga, *Untitled*, 1957, oil, watercolour, ink on paper mounted on canvas. The Japanese artist belonged to the Gutai ('Concrete') art association, which was devoted to ephemeral actions. Shiraga painted this monumental work, using various parts of his body, during one such performance (Photo © CNAC/MNAM/Réunion des Musées Nationaux/courtesy Art Resource, New York).



Plate 156 Jackson Pollock, *Number 1, 1948*, 1948, oil on canvas. In this archetypal, abstract painting, fashioned through drips and skeins of paint, the artist asserted his presence by including his handprints in the upper right corner (Photo © 2004 The Pollock-Krasner Foundation/Artist Rights Society [ARS], New York).



Plate 157 Robert Rauschenberg, *Coca-Cola Plan*, 1958, mixed media. Incorporating found objects, this sculpture speaks to the increasing importance of and interrelationship between popular and consumer culture in the USA (Photo © Robert Rauschenberg/Licensed by VAGA, New York).



Plate 158 Robert Smithson, No. 7 from *Yucatan Mirror Displacement*, 1–9, 1969, nine chromogenic development slides. In such site-specific works, known as land art, Smithson examined the relationship between an artwork and its environment (Photo © Estate of Robert Smithson/Licensed by VAGA, New York).

*Plate 159* Pierre de Coubertin, founder of the modern Olympic Games. Athens hosted the first Olympics in 1896, Greece being the original location of the games during Antiquity (Photo © CIO, Musée Olympique, Lausanne).



*Plate 160* Poster designed by French artist Auguste Matisse for the first Olympic Winter Games, held in Chamonix, France, in 1924 (Photo © CIO, Musée Olympique, Lausanne).



*Plate 161* Ethiopian Olympic champion Abebe Bikila won the marathon at the 1960 and 1964 Summer Olympics (Photo © Bettmann/Corbis).

*Plate 162*    Unemployed Chinese youth at the gates of the Forbidden City, Beijing. Many countries have tried to curb rising unemployment among young people by reforming their educational systems (Photo © Owen Franken).

*Plate 163*    A child taking a test based on the theories of Swiss developmental psychologist Jean Piaget. His research regarding the four stages of cognitive development in children has influenced educational policy and pedagogical methods (Photo © Laura Dwight).





*Plate 164*    New York City preschoolers watching the US-produced educational programme *Sesame Street*, 1970. The series first premiered in 1969 and continues to be broadcast worldwide (Photo © Bettmann/ Corbis).

Plate 165  UNESCO Headquarters in Paris, designed by Marcel Breuer, Pier Luigi Nervi and Bernard Zehrfuss, and inaugurated in 1958. A specialized agency of the UN, UNESCO promotes world peace and security through international collaborations in education, science and culture (Photo © Paul Almasy).
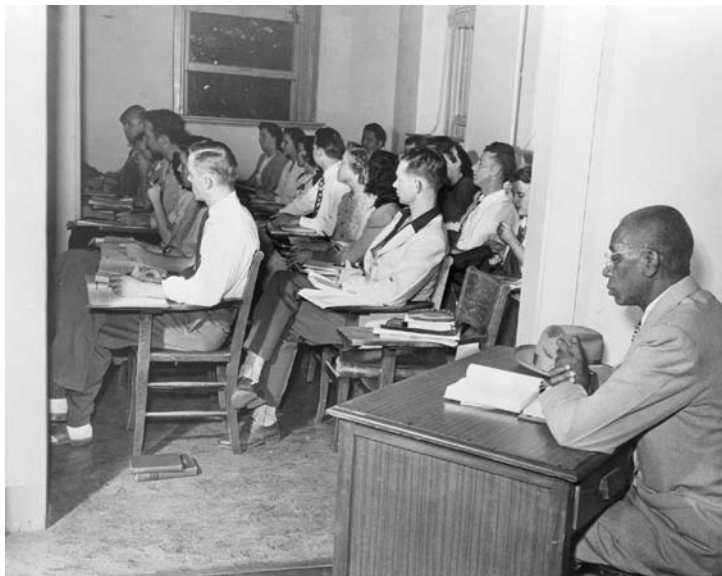


Plate 166  Racial segregation at the University of Oklahoma, 1948. Despite a 1954 US Supreme Court ruling that outlawed racial segregation in public education facilities, such practices persisted into the 1960s (Photo © Bettmann/Corbis).



Plate 167  Early US advertisement for Thomas Edison's Triumph phonograph. Invented in 1877, the phonograph transformed musical culture and leisure. It remained the most common form for playing recorded sound until the 1980s (Photo © Bettmann/Corbis).
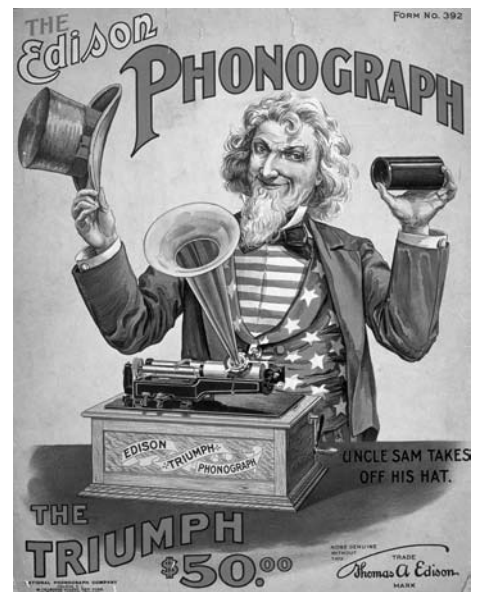
*Plate 168*　A publicity poster for the film *King Kong* (1933). The tremendous success of the Hollywood film industry produced a new form of mass culture, appealing to an international audience (Photo © Swim Ink 2, LLC/Corbis).

*Plate 169*   Tarahumara peasants in Mexico watching videos, 1991. The proliferation of VCRs and videotape recordings in the 1980s contributed to audio-visual globalization (Photo © Phil Schermeister).



*Plate 170*   The library in Holland House (1605), London, after a German bombing raid, 1940. During the Second World War, in Europe, Asia and the Pacific, irreplaceable treasures in numerous cultural institutions were either damaged, stolen or destroyed (Photo © Hulton-Deutsch Collection/Corbis).

Plate 171   Exterior view of the Georges Pompidou Centre (1977), Paris, designed by Renzo Piano, Richard Rogers and Gianfranco Franchini. The landmark building houses the Musée National d'Art Moderne (Photo © DeA Picture Library).



Plate 172   Video surveillance camera on a UK street. By the end of the 1990s, over 500 UK municipalities had installed such technology to survey public spaces, making the country the leader in urban video surveillance (Photo © Steve McDonough).