



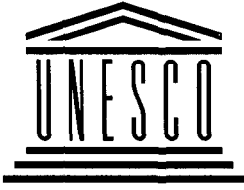
Edgar Morin

Seven complex
lessons
in education
for the future



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Education on the Move



United Nations Educational, Scientific and Cultural Organization

Seven complex lessons in education for the future

Edgar Morin

Translated from the French by Nidra Poller

The author takes sole responsibility for the ideas and opinions expressed herein, which do not necessarily reflect the views of UNESCO.

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Nelson Vallejo-Gómez was asked by UNESCO to integrate comments and suggestions from these personalities and to formulate his own contributions. The resulting modified version is presented here with my approval.

Once more, I wish to express my warm appreciation to all of these people for their invaluable contribution.

Preface by the Director-General of UNESCO

When we look to the future we confront many uncertainties about the world our children, grandchildren, and great grandchildren will live in. But we can be certain of at least one thing: if we want this earth to provide for the needs of its inhabitants, human society must undergo a transformation. The world of tomorrow must be fundamentally different from the world we know as we step into the 21st century and the new millennium. We must strive to build a "sustainable future." Democracy, equity, social justice, peace and harmony with our natural environment should be the watchwords of this world to come. We must make sure to place the notion of "durability" at the base of our way of living, of governing our nations and communities, of interacting on a global scale.

Education, in the broadest sense of the term, plays a preponderant role in this development aimed at fundamental changes in our ways of living and behaving. Education is the "force for the future" because it is one of the most powerful instruments of change. One of the greatest problems we face is how to adjust our way of thinking to meet the challenge of an increasingly complex, rapidly changing, unpredictable world. We must rethink our way of organizing knowledge. This means breaking down the traditional barriers between disciplines and conceiving new ways to reconnect that which has been torn apart. We have to redesign our educational policies and programs. And as we put these reforms into effect we have to keep our sights on the long term and honor our tremendous responsibility for future generations.

UNESCO has made an intense effort to rethink education in terms of durability, notably in the context of our function as guiding force of the "International work programme on education, public awareness and training for sustainability" launched in 1996 by the United Nations Commission for durable development. This project articulates priorities approved by member States and calls on those States, together with NGOs, business, industry, and the academic community, the United Nations system and international financial institutions to swiftly take measures to implement, through significant reform of national educational policies and programs, the new concept of education for a sustainable future. UNESCO has been called upon to propel and mobilize international action in this crucial endeavor,

To this end, UNESCO invited Edgar Morin to express his ideas on the essentials of education for the future as viewed in terms of his conception of "complex thought." The essay published here by UNESCO is an important contribution to international debate on ways of reorienting education toward durable development. Edgar Morin sets forth seven key principles that he considers essential for education of the future. My greatest wish is that his ideas will stimulate debate and help educators and officials to clarify their own thoughts on this vital problem.

I deeply appreciate the generous participation of Edgar Morin in agreeing, together with UNESCO, to stimulate a reflection that enlightens and orients debate within the transdisciplinary project "Educating for a Sustainable Future." And I would like to thank the international experts whose remarks and suggestions were an important contribution to this essay, with particular thanks to Nelson Vallejo-Gómez.

The commitment and wisdom of eminent thinkers like Edgar Morin is a priceless contribution to UNESCO's ongoing efforts to promote the profound changes in ways of thinking which are indispensable to the preparation for the future.

A handwritten signature in black ink, appearing to read 'Federico Mayor', with a long vertical stroke on the left side.

Federico Mayor

Foreword

This text stands prior to any suggested educational guide or curriculum. It is not meant to cover the totality of subjects that are or should be taught. The intention is simply to identify fundamental problems that are overlooked or neglected in education, and should be taught in the future.

These "seven lessons," or seven facets of essential knowledge, should be covered, without exclusivity or exclusion, in education for the future in all societies in every culture, according to the means and rules appropriate to those societies and cultures.

The scientific knowledge on which we rely here to support our vision of the human condition is provisional and open-ended; it leaves us with the profound mysteries of the Universe, Life, the birth of Human Beings. Science opens onto *undecidables* where philosophical options and religious beliefs come into play through cultures and civilizations.

Seven complex lessons

Chapter I: *Detecting error and illusion*

- The purpose of education is to transmit knowledge, and yet education is blind to the realities of human knowledge, its systems, infirmities, difficulties, and its propensity to error and illusion. Education does not bother to teach what knowledge is.
- Knowledge cannot be handled like a ready-made tool that can be used without studying its nature. Knowing about knowledge should figure as a primary requirement to prepare the mind to confront the constant threat of error and illusion that parasitize the human mind. It is a question of arming minds in the vital combat for lucidity.
- We must introduce and develop the study of the cultural, intellectual, and cerebral properties of human knowledge, its processes and modalities, and the psychological and cultural dispositions which make us vulnerable to error and illusion.

Chapter II: *Principles of pertinent knowledge*

- Here is a major problem that is always misunderstood: how can we encourage a way of learning that is able to grasp general, fundamental problems and insert partial, circumscribed knowledge within them.
- The predominance of fragmented learning divided up into disciplines often makes us unable to connect parts and wholes; it should be replaced by learning that can grasp subjects within their context, their complex, their totality.

- We should develop the natural aptitude of the human mind to place all information within a context and an entity. We should teach methods of grasping mutual relations and reciprocal influences between parts and the whole in a complex world.

Chapter III: *Teaching the human condition*

- Humans are physical, biological, psychological, cultural, social, historical beings. This complex unity of human nature has been so thoroughly disintegrated by education divided into disciplines, that we can no longer learn what human being means. This awareness should be restored so that every person, wherever he might be, can become aware of both his complex identity and his shared identity with all other human beings.
- The human condition should be an essential subject of all education.
- This chapter suggests how we can go from current disciplines to a recognition of human unity and complexity by assembling and organizing knowledge dispersed in the natural sciences, social sciences, literature, and philosophy, to demonstrate the indissoluble connection between the unity and the diversity of all that is human.

Chapter IV: *Earth identity*

- The future of the human genre is now situated on a planetary scale. This is another essential reality neglected by education, that should become a major subject. Knowledge of current planetary developments that will undoubtedly accelerate in the 21st century, and recognition of our earth citizenship, will be indispensable for all of us.
- The history of the planetary era should be taught from its beginnings in the 16th century, when communication was established between all five continents. Without obscuring the ravages of oppression and domination in the past and present, we should show how all parts of the world have become interdependent.
- The complex configuration of planetary crisis in the 20th century should be elucidated to show how all human beings now face the same life and death problems and share the same fate.

Chapter V: *Confronting uncertainties*

- We have acquired many certainties through science but 20th century science has also revealed many areas of uncertainty. Education should include the study of uncertainties that have emerged in the physical sciences (microphysics, thermodynamics, cosmology), the sciences of biological evolution, the historical sciences.

- We should teach strategic principles for dealing with chance, the unexpected and uncertain, and ways to modify these strategies in response to continuing acquisition of new information. We should learn to navigate on a sea of uncertainties, sailing in and around islands of certainty.
- "The expected doesn't occur and [the gods] open the door for the unexpected." These lines, composed more than 25 centuries ago by the Greek poet Euripides, are more than ever relevant. Determinist conceptions of human history that claimed to predict our future have been forsaken, the study of major events and accidents of our century shows how unexpected they were, the course of the human adventure is unpredictable: this should incite us to prepare our minds to expect the unexpected and confront it. Every person who takes on educational responsibilities must be ready to go to the forward posts of uncertainty in our times.

Chapter VI: *Understanding each other*

- Understanding is both a means and an end of human communication. And yet we do not teach understanding. Our planet calls for mutual understanding in all directions. Given the importance of teaching understanding on all educational levels at all ages, the development of this quality requires a reform of mentalities. This should be the task of education for the future.
- Mutual understanding among human beings, whether near or far, is henceforth a vital necessity to carry human relations past the barbarian stage of misunderstanding.
- Therefore, misunderstanding must be studied in its sources, modalities, and effects. This is all the more necessary in that it bears on the causes instead of the symptoms of racism, xenophobia, discrimination. And improved understanding would form a solid base for the education-for-peace to which we are attached by foundation and vocation.

Chapter VII: *Ethics for the human genre*

- Education should lead to an "anthropo-ethics" through recognition of the ternary quality of the human condition: a human being is an individual ↔ society ↔ species. In this sense, individual / species ethics requires control of society by the individual and control of the individual by society; in other words, democracy. And individual ↔ species ethics calls for world citizenship in the 21st century.
- Ethics cannot be taught by moral lessons. It must take shape in people's minds through awareness that a human being is at one and the same time an individual, a member of a society, a member of a species. Every individual carries this triple reality within himself. All truly human development must include joint development of individual

autonomy, community participation, and awareness of belonging to the human species.

From this point, the two great ethical-political finalities of the new millennium take shape: establishment of a relationship of mutual control between society and individuals by way of democracy, fulfillment of Humanity as a planetary community. Education should not only contribute to an awareness of our *Earth-Homeland*, it should help this awareness find expression in the will to realize our earth citizenship.

CHAPTER I

DETECTING ERROR AND ILLUSION

Everything we know is subject to error and illusion. The education of the future should confront this double-faced problem of error and illusion. The greatest error would be to underestimate the problem of error, the greatest illusion to underestimate the problem of illusion. Recognition of error and illusion is all the more difficult in that error and illusion are not recognized as such.

Error and illusion have been parasitizing the human mind from the first days of homo sapiens. When we consider the past, including the recent past, it seems to us that people were blinded by countless errors and illusions. In *German Ideology*, Marx and Engels observed that men have always had misconceptions about themselves, about what they are doing and what they ought to do, and about the world in which they live. But neither Marx nor Engels was able to avoid the same kind of errors.

1. THE ACHILLES HEEL OF KNOWLEDGE

Education should show that there is no learning which is not to some extent vulnerable to error and illusion. Information theory shows that the risk of error from random perturbations or "noise" is inherent in all transmission of information, all communication of messages.

Knowledge is not a mirror of things or of the outside world. All perceptions are cerebral translations and reconstructions of stimuli and signs captured and coded by the senses. As we well know this entails countless errors of perception, though these perceptions come from vision, our most reliable sense. Intellectual error combines with perceptual errors. Knowledge in the form of words, ideas and theories is the fruit of translation/reconstruction by way of language and thought and, as such, subject to error. This knowledge, being translation and reconstruction, involves interpretation, introducing the risk of error within the subjectivity of the knower, his world view, his principles of knowledge. This causes countless errors of conception and ideas that occur despite our rational controls. Projection of our fears and desires and mental perturbation from our emotions multiply the risk of errors.

One might then suppose that the risk of error could be eliminated by suppressing emotion. Sentiments, hatred, love, friendship may blind us but in fact intellectual and emotional development are inseparable in all mammals, and particularly human beings, whose curiosity and passion are the wellsprings of scientific and philosophic research. Affectivity may stifle knowledge, but it may also enrich it. Intelligence and affectivity are closely related: the ability to reason can be diminished or destroyed by an emotional deficit, and impaired ability to react emotionally may cause irrational behavior.

There is no superior stage of reason dominating emotion, there is an *intellect ↔ emotion* loop; in some respects emotional capacity is an absolute necessity for the functioning of rational behavior.

Advances in scientific knowledge provide powerful means of error detection and combat against illusion. However, the paradigms that control science can also develop illusions, and no scientific theory is forever immune to error. Moreover, scientific knowledge alone can not treat ethical, philosophical, or epistemological questions.

Education should strive to develop the ability to detect sources of error, illusion, and blindness.

1.1 Mental errors

No cerebral system gives us the power to distinguish hallucination from perception, dream from waking, the imaginary from the real, the subjective from the objective.

Human beings have an extraordinary capacity for fantasy and imagination. Entry and exit routes connecting the organism to the outside world make up only 2% of the entire neurocerebral system; the remaining 98% is devoted to inner functions. The brain constructs a quite independent psychic world where fantasies, needs, images, ideas, desires, and dreams ferment, and this world infiltrates our vision or conception of the outside world. Further, the mind of every human being is subject to self-deception, a permanent source of errors and illusions. Egocentricity, the need for self-justification, the tendency to project the cause of evil onto others, make people lie to themselves without detecting their own lies. Our memory itself is subject to many types of error. Memories that are not regenerated by remembrance tend to degenerate, but each remembrance may enhance or darken the memory. Our mind unconsciously tends to select memories that are advantageous to us and suppress or erase unfavorable memories; we give ourselves a flattering role. We tend to deform memories by unconscious projections or confusions. Sometimes false memories convince us we have experienced things that never happened to us, and suppressed memories deny things we did experience. So memory, an indispensable source of truth, is subject to error and illusion.

1.2 Intellectual errors

Our systems of ideas (theories, doctrines, ideologies) are subject to error and, in addition, they protect errors and illusions contained in themselves. Resistance to unsuitable or indigestible information is inherent to the organizational logic of all systems of ideas. Theories resist attack from adverse theories and arguments; even scientific theories, which are the only ones that accept the possibility of refutation, tend to manifest this resistance. Doctrines are self-enclosed theories absolutely convinced of their truth and invulnerable to all criticism that shows up their errors.

1.3 Errors of reason

The rational activity of the mind is what allows us to distinguish dream and waking, real and imaginary, subjective and objective. Rationality draws on various means of control: the environment (physical

resistance to desire and imagination from the surroundings), practice (verifying activity), culture (reference to common knowledge), other people (do you see the same thing as me?), the cortex (memory, logical operations). In other words, rationality is corrective.

Rationality is the best safeguard against error and illusion. There is a constructive rationality that develops coherent theories and verifies the logic of theoretical organization in terms of compatibility between various ideas composing the theory, and agreement between assertions and the empirical data to which it applies. This rationality must remain open to everything that disputes it; otherwise it closes itself into a doctrine and becomes rationalization. And there is a critical rationality which is exercised particularly on error and illusion in beliefs, doctrines, and theories. But rationality itself is subject to error and illusion when, as just indicated, it is perverted into rationalization. Rationalization believes itself to be rational because it constructs a perfectly logical system based on deduction or induction. However, rationalization is based on false or mutilated foundations, and remains closed to dispute from contradictory arguments and empirical verification. Rationalization is closed, rationality is open. Though rationalization draws on the same sources as rationality, it is one of the most powerful sources of error and illusion. A doctrine that obeys a mechanical, determinist model to consider the world is not rational but rationalized.

True rationality is by nature open and engaged in dialogue with the real, which resists it. It constantly goes back and forth between the logical instance and the empirical instance; it is the fruit of debate of ideas, and not the property of a system of ideas. Rationalism that ignores subjectivity, affectivity, life, and beings, is irrational. Rationality must recognize the contribution of emotions, love, repentance. True rationality knows the limits of logic, determinism, mechanics; it knows that the human mind cannot be omniscient, that mystery is part of reality. It negotiates with the obscure, the irrationalized, the irrationalizable. It is not only critical but self-critical. True rationality can be recognized by its capacity to recognize its own shortcomings.

Rationality is not an exclusive prerogative of scientific and technical minds, denied to others. Learned atomists, rational under laboratory constraints and in their sphere of competence, may be completely irrational in politics or private life.

Similarly, Western civilization does not have a monopoly on rationality. Long considering itself proprietor of rationality, Western Europe judged all cultures in terms of technological performance and saw nothing but error, illusion, and backwardness in other cultures. We should know that every society has rationality—including archaic societies with their rationality in tool-making, hunting strategy, and knowledge of plants, animals and terrain—and all societies have myth, magic, and religion. In our Western societies we have myth, magic, and religion, including the myth of providential reason and the religion of progress. We start to become truly rational when we recognize the rationalization included in our rationality, and recognize our own myths, including the myths of our almighty reason and guaranteed progress.

This is why, in educating for the future, we must recognize the *principle of rational uncertainty*; if rationality does not maintain constant self-critical vigilance it can turn into rationalizing illusion. Which is to say

that true rationality is not only theoretical, not only critical, but also self-critical.

1.4 Blinding paradigms

The play of truth and error not only functions in the empirical verification and logical coherence of theories. It also functions profoundly in the invisible depths of paradigms. This is why education must learn to examine them.

A paradigm can be defined as:

- *The promotion/selection of master concepts of intelligibility.* Order in determinist concepts, *Matter* in materialistic concepts, *Mind* in spiritual concepts, *Structure* in structuralist concepts are the master selected/selecting concepts that exclude or subordinate antinomical concepts (disorder, mind, matter, event). Thus, the paradigmatic level is the level of the principle of selection of ideas to be integrated into the discourse or theory, or refused and rejected.
- *Determination of master logical operations.* The paradigm, hidden beneath the logic, selects the logical operations that become preponderant, pertinent, and evident under its dominion (exclusion-inclusion, disjunction-conjunction, implication-negation). The paradigm grants privilege to certain logical operations to the detriment of others, such as disjunction to the detriment of conjunction; and grants validity and universality to its chosen logic. Thereby it gives the qualities of necessity and truth to the discourse and theory it controls. By prescription and proscription the paradigm founds the axiom and expresses itself in the axiom ("*every natural phenomenon obeys determinism,*" "*every properly human phenomenon is defined by opposition to nature*"...).

Thus the paradigm selects and determines conceptualization and logical operations. It designates the fundamental categories of intelligibility and controls their use. Individuals know, think, and act according to interiorized culturally inscribed paradigms.

For example, there are two opposite paradigms concerning the *man* ↔ *nature* relation. The first paradigm includes the human in nature; all discourse under its dominion makes man a natural being and recognizes "human nature." The second paradigm prescribes disjunction between these two terms, and determines man's specificities by exclusion of the idea of nature. These two contrary paradigms share a common obedience to an even deeper paradigm, the paradigm of simplification which, in the face of any conceptual complexity, prescribes either reduction (here, of the human to the natural) or disjunction (here, between the human and the natural). Both of these paradigms preclude conception of the *uniduality* (*natural* ↔ *cultural*, *cerebral* ↔ *psychic*) of human reality, and also preclude conception of both implication and separation in the relation between man and nature. Only a complex paradigm of implication/distinction/conjunction would allow such a conception. But it is not yet inscribed in scientific culture.

The paradigm is both underground and sovereign in all theories, doctrines, and ideologies. The paradigm is unconscious but it irrigates and controls conscious thought, making it also Super-conscious.

In short, the paradigm institutes primordial relations that form axioms, determine concepts, command discourse and/or theories. It organizes their organization and generates their generation or regeneration.

The "great Western paradigm," formulated by Descartes and imposed by developments in European history since the 17th century, should be mentioned here. The Cartesian paradigm disconnects subject and object, each in its own sphere: philosophy and reflective research here, science and objective research there. This dissociation goes right through the universe:

Subject / Object
Soul / Body
Mind / Matter
Quality / Quantity
Finality / Causality
Sentiment / Reason
Liberty / Determinism
Existence / Essence

It is indeed a paradigm. It determines the Sovereign concepts and prescribes the logical relation of disconnection. Disobedience to this disconnection is necessarily clandestine, marginal, deviant. This paradigm determines a double vision of the world, in fact a doubling of the world. One is a world of objects that can be observed, experimented, manipulated. The other is a world of subjects that raise problems of existence, communication, conscience, destiny. A paradigm may elucidate and blind, reveal and obscure. There, deeply ensconced inside the paradigm, lies a crucial factor in the game of truth and error.

2. IMPRINTING AND NORMALIZATION

The determinism of paradigms and explanatory models combines with the determinism of convictions and beliefs which, when they rule over a society, impose on one and all the imperative force of the sacred, the normalizing force of dogma, the prohibitive force of taboo. Dominant doctrines and ideologies also dispose of the imperative force that brings evidence to those who are already convinced, and coercive force that instills inhibitory fear in those who might have doubted.

The prohibitive and imperative powers of paradigms, official beliefs, sovereign doctrines, and established truths combine to determine cognitive stereotypes, unquestioned received ideas, uncontested stupid beliefs, triumphant absurdities, and rejections of evidence in the name of evidence to expand their reign of intellectual and cognitive conformism in all latitudes.

All the truly social-economic-political determinations (power, hierarchy, class divisions, specialization and, in our modern times, technobureaucratization of work) converge and synergize with all the truly cultural determinations to imprison knowledge in a multideterminism of imperatives, standards, prohibitions, rigidities, deadlocks.

Cognitive conformism is much more than conformism. It is *cultural imprinting*, a template imprint that inscribes conformism in depth, a *normalization* that eliminates anything that might dispute it. Imprinting is the term used by Konrad Lorenz to describe the indelible mark imposed by the first experiences of a young animal, such as the newly hatched chick who follows the first living creature that goes by, making it its mother. H. C. Anderson already told his version of the story in *The Ugly Duckling*. Cultural imprinting marks human beings from birth with the seal of family culture, followed by school culture, and then university and professional culture.

Cultural and sociological selection of ideas rarely obeys their truth; on the contrary, it may be pitiless for the search for truth.

3. NOOLOGY: POSSESSION

According to Marx "the products of the human mind appear as independent beings, endowed with individual bodies, in communication with humans and among themselves."

Taking this one step further, we can say that beliefs and ideas are not only products of the mind, they are also states of mind that have life and power. That is why they can possess us.

We should be aware that a noosphere arose in the very dawn of humanity, a sphere of things of the mind with its parade of myths and gods, and the extraordinary upsurge of these spiritual beings pushed and dragged homo sapiens into exaltation, adoration, ecstasies, massacres, cruelties, and sublimities unknown in the animal kingdom. Ever since that dawning we live in the depths of a forest of myths that enrich our cultures.

The noosphere, pure creation of our souls and minds, is in us and we are in the noosphere. Myths took shape, consistence, reality from fantasies formed in our dreams and imaginations. Ideas took shape, consistence, reality from symbols and thoughts of our intelligence. Myths and Ideas came back to us, invaded us, gave us emotion, love, hate, ecstasy, fury. Possessed humans can die or kill for a god, for an idea. Still today at the dawn of the third millennium, our "ideal" demons, like the Greek Daemons and sometimes like the demons of the Gospel, submerge our consciousness, make us unconscious while giving us the illusion of being hyper conscious.

Societies domesticate individuals by myths and ideas which in turn domesticate societies and individuals, but individuals could reciprocally domesticate their ideas just as they could control their society which controls them. In the complex (complementary-antagonistic-uncertain) game of mutual servitude-exploitation-parasitism between the three instances (*individual ↔ society ↔ noosphere*) there may be room to seek symbiosis. Which does not mean making an ideal of the reduction of ideas to pure instruments and turning them into things. Ideas exist by and for man, but man also exists by and for ideas. We cannot make good use of ideas unless we also know how to be useful to them. Shouldn't we realize that we are possessed, so we can dialogue with our ideas, control them as much as they control us, and submit them to tests of truth and error?

An idea or a theory should not be purely and simply instrumentalized, nor should it tyrannically impose its verdicts; it should be relativized and *domesticated*. A theory should assist and orient the cognitive strategies adopted by human subjects.

It is hard for us to distinguish the moment of separation and opposition between things that come from the same source: *Ideality*, a mode of existence required for the Idea to convey the real, and *Idealism*, the real possessed by the idea; rationality, a system of dialogue between the idea and the real, and rationalization, which blocks such dialogue. Similarly, it is very hard to recognize the myth hidden under the label of science or reason.

Again we see that the major intellectual obstacle to learning lies in our intellectual means of learning. Lenin said that the facts are stubborn. He did not realize that fixed ideas and driving ideas—his very own ideas—are even more stubborn. Myth and ideology destroy and devour facts.

And yet it is by ideas that we can perceive the shortcomings and dangers of the idea. Whence the inescapable paradox: **we have to lead a crucial battle against ideas but we cannot do it without the help of ideas**. We should always remember to keep our ideas in their place as mediators and not identify them with reality. The only ideas we should trust are ideas that include the idea that the real resists the idea. This is an indispensable task in the fight against illusion.

4. THE UNEXPECTED...

The unexpected surprises us. Because we are too safely ensconced in our theories and ideas, and they are not structured to receive novelty. But novelty constantly arises. There is no way we can predict it exactly as it will occur, but we should always expect it, expect the unexpected (cf., Chapter V *Confronting uncertainties*). And once the unexpected has happened, we must be able to revise our theories and ideas instead of pushing and shoving the new fact in an attempt to stuff it into a theory that really can't accommodate it.

5. UNCERTAIN KNOWLEDGE

So many sources, so many causes of error and illusion endlessly renewed in all our learning!

This is why, in all stages of education, we must bring out major questions on the possibility of true knowledge. Just as oxygen killed primitive forms of life until living beings were able to use this toxin as a detoxicator, so uncertainty, which kills simplistic learning, is the detoxicator of complex knowledge. Nonetheless, learning will always be an adventure for which education should supply the indispensable travel kit.

Learning about learning, which includes integrating the learner into his knowledge, should be recognized by educators as a basic principle and permanent necessity.

We should understand that there are bioanthropological conditions (aptitudes of the human *brain* ↔ *mind*), sociocultural conditions (culture open to dialogue and exchange of ideas), and noological conditions (open

theories) that permit "true" questioning, meaning fundamental questioning of the world, man, and knowledge itself.

We should understand that in the search for truth self-observation is inseparable from observation, self-criticism inseparable from criticism, processes of reflection inseparable from processes of objectivation.

We should learn that the search for truth requires seeking and developing meta-viewpoints allowing for reflectivity, particularly integration of the observer-conceiver in the observation-conception, and ecologizing the observation-conception in its own mental, cultural context.

We can even make use of the faculty of ideas to possess us, and let ourselves be possessed by ideas of criticism, self-criticism, openness, complexity. The ideas I defend here are not so much ideas I possess as ideas that possess me.

More generally, we should try to play on these double possessions of ideas by our mind and our mind by ideas, to reach forms where mutual servitude would become conviviality.

Because this is a key problem: how can we establish conviviality with our ideas as with our myths?

The human mind should beware of its ideal products which are at the same time a vital necessity. We must exert constant control in order to avoid idealism and rationalization. We need mutual negotiations and controls between our minds and our ideas. We need exchange and communication between the different regions of our minds. We must be aware of the *ça* [that] and the *on* [one] that speak through the *je* [I], and we must be constantly alert to detect self-deception.

We need to civilize our theories, we need a new generation of open, rational, critical, reflective, self-critical theories that can reform themselves.

We have to find meta-viewpoints on the noosphere that can only be found with the help of complex ideas, in cooperation with our minds, themselves seeking meta-viewpoints for self-observation and self-conception.

We need a paradigm compatible with complex knowledge to crystallize and take root.

Possibilities of error and illusion are multiple and permanent: they come from the social and cultural exterior to inhibit the mind's autonomy and prohibit the search for truth; they come from within, sometimes ensconced in our best means of knowing, and cause the mind to make mistakes itself and about itself. Such terrible suffering and aberrations have been caused by errors and illusions down through human history, culminating in the most horrifying suffering and aberrations in our 20th century!

The cognitive problem has great historical, social, political, and anthropological importance. If we can hope for basic progress in the 21st century it would be that men and women could stop being the unconscious toys of their ideas and not only their ideas but their own self-deception. The major responsibility of education is to arm every single person for the vital combat for lucidity.

CHAPTER II

PRINCIPLES OF PERTINENT KNOWLEDGE

1. PERTINENCE IN KNOWLEDGE

If we are to escape from cognitive infirmity we must try to have knowledge of key problems of the world, key information about the world, no matter how difficult and hazardous the task may be. And all the more so today, when the context of all ecological, anthropological, economic, and political knowledge is...the world itself. In this planetary era we have to situate everything in the planetary complex and context. Learning about the world as world has become a vital and intellectual necessity. The universal problem for every citizen of the new millennium is *how to get access to information about the world, and how to acquire skills to articulate and organize that information. How to perceive and conceive the Context, the Global (the whole/parts relation), the Multidimensional, the Complex.* To articulate and organize and thereby recognize and understand the problems of the world, we need a reform in thinking. And this reform is paradigmatic, not programmatic. It is the fundamental question for education because it concerns our ability to organize knowledge.

The *education of the future* is faced with this universal problem because our compartmentalized, piecemeal, disjointed learning is deeply drastically inadequate to grasp realities and problems which are ever more global, transnational, multidimensional, transversal, polydisciplinary, and planetary.

This inadequacy obscures:

- ◆ **The context**
- ◆ **The global**
- ◆ **The multidimensional**
- ◆ **The complex**

If knowledge is to be pertinent, education must elucidate these factors.

1.1 The context

Knowledge of isolated information or data is not enough. To have meaning, information and data must be placed in their context. To have meaning, a word needs a text which is its own context and the text needs a context within which it is stated. The meaning of the word "love" in a religious context is different from the same word in a profane context, and the truth of a declaration of love has a different meaning when pronounced by the seducer or the seduced.

Claude Bastien notes that "cognitive evolution does not go in the direction of putting increasingly abstract learning in place but placing it in

context,"¹ context which determines the conditions of its insertion and the limits of its validity. Bastien adds that "contextualization is an essential condition of the efficiency of [cognitive function]."

1.2 The global (relation between the whole and parts)

The global is more than the context it is the totality containing the various parts which are connected in an inter-retroactive or organizational way. Thus society is more than a context, it is an organizing whole of which we are part. Planet Earth is more than a context, it is a whole, both organizer and disorganizer, of which we are part. The whole has qualities or properties that would not be in the parts if they were isolated from each other, and certain qualities or properties of the parts may be inhibited by strictures exerted by the whole. Marcel Mauss said: "We must recompose the whole." Yes, we must recompose the whole in order to know the parts.

Whence the cognitive virtue of Pascal's principle from which education of the future should draw inspiration: "all things being caused and causing, assisted and assisting, mediate and immediate, and all of them joined by an intangible natural bond that connects the most distant and the most variant, I hold it impossible to know the parts without knowing the whole, or to know the whole without individually knowing the parts"²

Moreover, in human beings as in other living creatures, the whole is present within the parts; every cell of a multicellular organism contains the totality of its genetic patrimony, and society inasmuch as a whole is present within every individual in his language, knowledge, obligations, and standards. Just as each singular point of a hologram contains the totality of information of that which it represents, each singular cell, each singular individual contains hologrammatically the whole of which he is part and which is at the same time part of him.

1.3 The multidimensional

Complex unities such as human beings or societies are multidimensional: a human being is a biological, psychological, social, emotional, rational being. Society includes historical, economic, sociologic, religious dimensions... Pertinent knowledge must recognize this multidimensionality and insert its data within it. Not only should a part not be isolated from the whole, the parts should not be isolated from each other. The economic dimension, for example, is in permanent inter-retroaction with all other human dimensions; moreover, human passions, needs, and desires that go beyond solely economic interests are carried hologrammatically within the economic.

¹ Bastien, Claude. "Le décalage entre logique et connaissance," *Courrier du CNRS: N° 79, Sciences cognitives*, October 1992.

² Pascal. *Pensées*, text established by Brunschwig, Léon, ed. Garnier-Flammarion, Paris, 1976.

1.4 The complex

Pertinent knowledge must confront complexity. *Complexus* means that which is woven together. In fact there is complexity whenever the various elements (economic, political, sociological, psychological, emotional, mythological...) that compose a whole are inseparable, and there is inter-retroactive, interactive, interdependent tissue between the subject of knowledge and its context, the parts and the whole, the whole and the parts, the parts amongst themselves. Complexity is therefore the bond between unity and multiplicity. Developments proper to our planetary era confront us more frequently, ineluctably with the challenge of complexity.

Consequently, education must encourage "general intelligence" apt to refer to the complex, the context, in a multidimensional way, within a global conception.

2. GENERAL INTELLIGENCE

As H. Simon expressed it, the human mind is a "G.P.S. (General Problems Setter and Solver." Contrary to what is widely believed, developing general aptitudes of the mind improves the capacity to develop particular or specialized skills. The more powerful the general intelligence, the greater the ability to treat special problems. Further, to understand specific data we have to activate general intelligence which operates and organizes the mobilization of knowledge of the whole for each particular case.

As knowledge strives to build by reference to the context, the global, the complex, it must mobilize what the knower knows about the world. As François Recanati observed: "understanding statements, far from being reduced to pure and simple deciphering, is a non-modular process of interpretation that mobilizes general intelligence and draws broadly on knowledge about the world." There is a correlation between mobilizing knowledge of the whole and activating general intelligence.

Education should encourage the natural aptitude of the mind to set and solve essential problems and, reciprocally, should stimulate full exercise of general intelligence. This full exercise requires the free exercise of the most well-distributed, most vigorous faculty of children and adolescents—curiosity—a faculty that is too often stifled by teaching instead of being stimulated as it should be or awakened if it is asleep.

To fulfill its mission of encouraging general intelligence, education for the future should use existing knowledge while overcoming antinomies provoked by progress in specialized learning (cf., 2.1), and identify false rationality (cf., 3.3).

2.1 Antinomy

Gigantic progress in knowledge has been accomplished within the framework of disciplinary specializations during the 20th century. But this progress is dispersed and disjointed, precisely because of specialization, which often shattered contexts, globalities, complexities. As a result,

tremendous obstacles that hinder the exercise of pertinent knowledge have accumulated right within our educational systems.

These systems make the disjunction between the humanities and the sciences, and the division of the sciences into disciplines that have become hyper-specialized, self-enclosed.

Complex global realities are shattered, the human is dislocated and redistributed. The biological dimension, including the brain, is enclosed in biological departments; the psychological, social, religious, and economic dimensions are separated from each other and relegated to social science departments; the subjective, existential, poetic qualities are restricted to literature and poetry departments. And philosophy, which by nature is a reflection on all human problems, becomes a self-enclosed realm. Fundamental problems and global problems are pushed out of disciplinary science. They are safeguarded only in philosophy, but no longer sustained by contributions from the sciences.

In these conditions, minds shaped by disciplines lose their natural aptitude to contextualize knowledge and integrate it into its natural entities. A weakened perception of the global leads to a weakened sense of responsibility (each individual tends to be responsible solely for his specialized task) and weakened solidarity (every individual loses the feeling of his ties to fellow citizens).

3. THE ESSENTIAL PROBLEMS

3.1 Disjunction and closed specialization

In fact, hyper-specialization³ keeps us from seeing the global (which it fragments) and the essential (which it dissolves). And it keeps us from correctly treating specific problems that cannot be raised and thoughtfully considered out of context. Essential problems are never fragmented and global problems are ever more essential. Whereas general culture comprised an incentive to try to place all ideas and information in context, disciplinary scientific and technological culture fragments, disjoins, and compartmentalizes knowledge, making it increasingly difficult to place it in context.

And cutting thought up into disciplines makes us unable to grasp "that which is woven together" or, in the original meaning of the term, the complex.

Specialized knowledge is a particular form of abstraction. Specialization "ab-stracts [*ab-strait*]" or tears out an object from its context and entity, cuts its ties and intercommunications with the environment, and inserts it in an abstract conceptual sector, the compartmentalized discipline whose frontiers arbitrarily break the systemicity (relation of a part to the whole) and multidimensionality of phenomena. Specialization leads to mathematical abstraction operating in itself a cleavage with the concrete, favoring whatever can be calculated and formalized.

³ That is, self-enclosed specialization that does not allow for integration into a global problematic or overall conception of the object of which it considers only one aspect or part.

For example, economics, the most mathematically advanced social science is the most socially, humanly backward science because it has abstracted itself from the social, historical, political, psychological, and ecological conditions inseparable from economic activity. This is why the experts are increasingly unable to interpret the causes and consequences of monetary and stock market perturbations, or foresee and forecast economic trends, even on the short term. Thus, error in economics becomes a primary consequence of the science of economics.

3.2 Reduction and disjunction

Up to the mid-20th century, most scientific disciplines obeyed the principle of reduction of the knowledge of a whole to knowledge of its parts, as if the organization of an entity did not produce new qualities or properties with respect to the parts taken in isolation.

The principle of reduction inevitably results in reduction of the complex to the simple. It applies to living human complexities the mechanical determinist logic of artificial machines. And it may obscure the truth and eliminate all elements that cannot be measured and quantified, taking the human out of what is human, the passions, emotions, sorrows and joys. Further, when the principle of reduction is applied in strict obedience to the determinist postulate it obscures what is fortuitous, new, inventive.

Because we were taught to separate, compartmentalize, isolate learning instead of making connections, the whole of our knowledge forms an unintelligible puzzle. Interactions, retroactions, contexts and complexities, lost in the no man's land between different disciplines, become invisible. The major human problems disappear, obscured by specific technical problems. The inability to organize scattered compartmentalized learning leads to atrophy of the natural mental disposition to contextualize and globalize.

Fragmented, compartmentalized, mechanized, disjunctive, reductionist intelligence breaks the complex of the world into disjointed fragments, fractures problems, separates what is connected, makes the multidimensional unidimensional. This intelligence is nearsighted and often goes blind. Possibilities of comprehension and reflection are nipped in the bud, the chances of corrective judgment or a long term view are drastically reduced. We find ourselves in a vicious cycle of increasingly multidimensional problems, increasing incapacity to think multidimensionally; the crisis worsens as fast as the incapacity to reflect on the crisis increases; the more planetary our problems, the more they are left unthought. Blind intelligence, unable to envisage the planetary context and complex, makes us unaware, unconcerned, and irresponsible.

3.3 False rationality

In his science fiction tetralogy (*Hyperion* and its sequels), Dan Simmons imagines a world where technological emancipation has produced a techno-center dominated by A.I.s (artificial intelligences) who try to get control over human beings. Our problem as human beings is to benefit from technology without becoming subordinate to it.

We are on our way to becoming subordinate to A.I.s deeply implanted in our minds in the form of technocratic thinking. This thinking, which is pertinent for all that concerns artificial machines, does not understand living things and human beings to which it is applied in the belief that it is the only rational thought.

In fact, false rationality, that is, abstract unidimensional rationalization, triumphs over the earth.⁴ Supposedly rational solutions from experts convinced they are working toward rational progress have been applied here there and everywhere for decades. Disregarding as "superstition and irrational fears" the resistance of local populations, these experts have managed to impoverish in enriching and destroy in creating. Land clearance and deforestation of extensive acreage all over the planet contributes to hydric imbalance and spread of deserts. If left unregulated this blind deforestation could dry up the Amazon River and turn the tropical sources of the Nile into arid wadis for nine months of the year. Elsewhere vast monocultures have eliminated small subsistence polycultures, aggravating famine, provoking rural exodus and the buildup of urban shanty towns. As François Garczynski observes, "that kind of agriculture creates deserts in two meanings of the term: soil erosion and rural exodus." This pseudo-functional development that neglects non-quantifiable, non-identifiable needs has led to the multiplication of urban slums and new towns that quickly become islands of boredom, filth, deterioration, neglect, depersonalization, and delinquency. The former Soviet Union accomplished monumental masterpieces of technobureaucratic rationality: river courses were changed to irrigate in the heat of the day cotton fields with no shade trees, contaminating the soil by leaching deep underground salt, exhausting underground water supplies, drying up the Aral sea. Degradation in the USSR was worse than in the West, because Soviet technobureaucrats did not have to deal with pressure from citizens. Unfortunately, after the collapse of the Soviet Union, directors of the new States turned to Western free enterprise experts who deliberately ignored the fact that free market competition requires institutions, rules, and laws. And these experts, who could not elaborate the indispensable complex strategy already indicated by Maurice Allais—himself a free market economist—which implies planning the unplanning and programming the deprogramming, brought on new disasters.

⁴ It happens that salutary intentions, when they obey false rationality, result in harmful effects that counterbalance or even surpass their beneficial effects. The *Green Revolution*, promoted to feed the Third World, significantly increased its alimentary resources and helped avoid famine; however the original, apparently rational but abstractly maximizing idea had to be modified. The idea was to select one single vegetal genome that was quantitatively the most productive and multiply it over vast acreage. But it turned out that in the absence of genetic variety the pathogenic agent that this genome could not resist could wipe out the entire harvest in one season. Some genetic variety had to be reestablished in order to optimize rather than maximize yield. Elsewhere, massive application of fertilizer degrades the soil, irrigation systems inadapted to the terrain cause erosion, the accumulation of pesticides destroys regulation among species and eliminates the useful along with the harmful, sometimes provoking unhindered multiplication of a harmful species immunized against pesticides, and toxic substances in the pesticides go into the food chain and affect consumer health.

All of this results in human catastrophes whose consequences and victims, unlike the victims of natural catastrophes, are not acknowledged or accounted for.

The 20th century lived under the dominion of pseudo-rationality claiming to be the sole rationality, which atrophied comprehension, reflection, and long-term vision. Inadequate to handle the most serious problems, this pseudo-rationality created one of the most serious problems ever to face humanity.

Which leaves us with the paradox: the 20th century produced gigantic progress in all fields of scientific knowledge and technology. At the same time it produced a new kind of blindness to complex, fundamental, global problems, and this blindness generated countless errors and illusions, beginning with the scientists, technicians, and specialists themselves.

Why? Because the major principles of pertinent learning are misunderstood. Fragmentation and compartmentalization of knowledge keeps us from grasping "that which is woven together."

Shouldn't the coming century liberate itself from the control of mutilated mutilating rationality so that the human mind can finally control it? It means understanding disjunctive, reductive thought by exercising thought that distinguishes and connects. It does not mean giving up knowledge of the parts for knowledge of the whole, or giving up analysis for synthesis, it means conjugating them. This is the challenge of complexity which ineluctably confronts us as our planetary era advances and evolves.

CHAPTER III

TEACHING THE HUMAN CONDITION

The education of the future should be a universal, first [*premier*] education bearing on the human condition. We live in a planetary era: all human beings, wherever they may be, are embarked on a common adventure. They should recognize themselves in their common humanity and recognize the cultural diversity inherent in everything human.

To know that which is human we must begin by locating it in the universe, not extricating it. As observed above (Chapter I), if knowledge is to be pertinent it should contextualize its subject. "*Who are we?*" is inseparable from "*where are we?*" "*where do we come from?*" "*where are we going?*"

Questioning our human condition begins with questioning our situation in the world. An influx of knowledge at the end of the 20th century sheds new light on the situation of human beings in the universe. Parallel progress in cosmology, earth sciences, ecology, biology, and prehistory in the 60s and 70s have modified our ideas about the Universe, the Earth, Life, and Man himself. But these contributions remain disjointed. That which is Human is cut up into pieces of a puzzle that cannot form an image. This raises an epistemological problem: it is impossible to conceptualize the complex unity of the human by way of disjunctive thought—that gives an insular conception of our humanity, outside the cosmos in which we live, without the physical and spiritual matter of which we are made—or reductive thought, that reduces human unity to a purely bioanatomical substrate. The social sciences themselves are fragmented and compartmentalized. Human complexity becomes invisible and man vanishes "like footsteps in the sand." The new knowledge, for lack of being connected, is neither assimilated nor integrated. There is progress in knowledge of the parts and paradoxical ignorance of the whole.

Education for the future must make a concerted effort to regroup this scattered knowledge—from the natural sciences, to situate the human condition in the world; from the social sciences, to shed light on human multidimensionality and complexity—and integrate into this scientific knowledge the priceless contribution of the humanities, not only philosophy and history, but also literature, poetry, the arts....

1. ROOTED ↔ UPROOTED HUMANITY

We should recognize that we are doubly rooted in the physical cosmos and the living sphere, and at the same time uprooted in a strictly human way. We are both inside and outside nature.

1.1 The cosmic condition

In recent times we have abandoned the idea of an orderly, perfect, eternal Universe in exchange for an expanding universe where order, disorder, and organization are at play in a complementary, competitive,

antagonistic dance. We live in a gigantic expanding cosmos composed of billions and billions of stars in billions of galaxies, and we have learned that our earth is a tiny top revolving around a star that wanders at the periphery of a small suburban galaxy. The particles that make up our organism appeared in the very first seconds of life in our cosmos, fifteen billion (perhaps?) years ago; our carbon atoms were constituted in one or several suns that preceded our own; our molecules combined in the earliest convulsive times of the Earth; these macromolecules joined together within whirlwinds and one of them, growing ever richer in molecular diversity, metamorphosed into something new and very different from the previous, strictly chemical organization, to create *living self-organization*.

This cosmic epic of organization endlessly subject to forces of disorganization and dispersion is also the epic of connection [*reliance*] which kept the cosmos from dispersing or disappearing as soon as it came into being. In the heart of the cosmic adventure, at the furthest point of the prodigious development of a singular branch of living self-organization, we pursue the adventure in our own way.

1.2 The physical condition

A bit of physical substance organized itself thermodynamically on this earth. Soaked in brine, stewed in chemicals, jolted with electrical charges, it came to Life. Life is solarian: all its components were forged in a sun and assembled on a planet spit out by the sun; life is the transformation of photons trickling down from flamboyant solar whirlwinds. We, the living, are a straw of the cosmic diaspora, a few crumbs of solar existence, a tiny budding of earthly existence.

1.3 The earthly condition

We are part of cosmic destiny but we are a fringe group: our Earth is the third satellite of a sun cast out of its central throne to become a heavenly pygmy wandering among billions of stars in a peripheral galaxy of an expanding universe...

Five billion years ago our planet was formed, apparently an aggregate of cosmic detritus from the explosion of an earlier sun and four billion years ago living organization emerged from a macromolecular whirlwind in the midst of howling tellurian storms and convulsions.

The Earth produced and organized itself within its dependence on the sun and, when it developed its biosphere, constituted itself as a biophysical complex.

We are both cosmic and terrestrial beings.

Life was born in tellurian convulsions and at least twice faced the danger of extinction (end of the primary and in the course of the secondary). Life diversified in species and organized in ecosystems where predation and devouring interlocked in the two-faced trophic chain of life and death.

Our planet wanders in the cosmos; we should draw the consequences of our peripheral, marginal situation.

As living beings on this planet we vitally depend on the terrestrial biosphere; we should recognize our very physical and biological earthly identity.

1.4 The human condition

The study of hominization is of capital importance for education to the human condition because it shows how our human condition is a combination of animality and humanity.

Prehistoric anthropology teaches us that hominization was a both continuous and discontinuous adventure extended over a period of millions of years. Discontinuous, with the appearance of new species—*habilis*, *erectus*, *Neanderthal*, *sapiens*—the disappearance of their predecessors, and the emergence of language and culture. Continuous, in an uninterrupted process of becoming biped, manual, upright, cerebral⁵, juvenile (the adult conserves non specialized properties of the embryo and psychological properties of youth), socially complex; a process that includes the acquisition of truly human language and culture, with a capital of knowledge, skills, beliefs, and myths, that can be transmitted from generation to generation...

Hominization led to a new beginning. The hominid was humanized. Thereafter, the concept of man has a double entry—one biophysical and the other psycho-socio-cultural—with reverberation between the two entries.

We are born of the cosmos, of nature, of life, but our humanity, our culture, our mind, our consciousness, has made us strangers to this cosmos that remains secretly intimate to us. Our thought, the very consciousness by which we know this physical world, carries us as far away from it. The very fact that we consider the universe rationally and scientifically separates us from it. We have evolved beyond the physical, living world. And in this beyond, humanity spreads its wings.

Like a point in a hologram we carry our singularity within; we carry all humanity, all life, and almost all of the cosmos with its mystery lying deep in the heart of human nature. But we are beings who cannot be known and understood uniquely by cosmology, physics, biology, psychology...

2. THE HUMAN IN HUMANS

2.1 Uniduality

Humans are thoroughly biological, thoroughly cultural beings who carry this originary uniduality inside themselves. By the extraordinary development of their life potential, human beings have become super-hyper living creatures. Humans give hypertrophied expression to the egocentric and altruistic properties of the individual, reach paroxysms of vitality in ecstasies and intoxications, burn with orgiastic and orgasmic ardor; and in this hyper-vitality, *homo sapiens* is also *homo demens*.

⁵ Cranium of *Australopithecus* (508 cm³), *homo habilis* (680 cm³), *homo erectus* (800-1110 cm³), modern man (1200-1500 cm³).

Man is a thoroughly biological being but if he did not fully dispose of culture he would be one of the lowest ranking primates. Culture accumulates that which is conserved, transmitted, and learned, including standards and principles of acquisition.

2.2 The brain ↔ mind ↔ culture loop

Man fulfills himself as a thoroughly human being only in and by culture. There is no culture in the human brain (biological apparatus able to act, perceive, know, learn), but there is no mind (*esprit, mente*) no capacity for consciousness and thought, without culture. The human mind is an emergence, created and affirmed in the brain-culture relationship. Once the mind has emerged it intervenes in cerebral function and retroacts with it. This gives us a triad, a *brain ↔ mind ↔ culture* loop, where each term is necessary to each of the others. The mind is an emergence of the brain brought forth by culture and it would not exist without the brain.

2.3 The reason ↔ emotion ↔ impulse loop

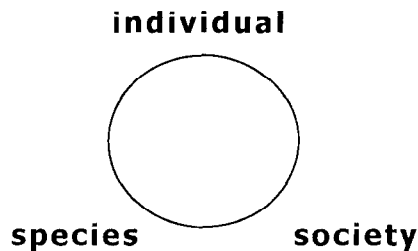
And there is another bioanthropological triad, different from the *brain ↔ mind ↔ culture* loop, drawn from MacLean's⁶ concept of the triune brain. The human brain has integrated three cerebral stages: a) the *paleocephalic*, heritage of the reptilian brain, source of aggression, rut, primary impulses; b) the *mesocephalic*, heritage of the ancient mammal brain, where the hippocampus seems to link the development of affectivity and long term memory; c) the *cortex*, so highly developed in mammals that it envelops all the structures of the encephalus to form the two cerebral hemispheres, but hypertrophied in humans into a neo-cortex, which is the seat of analytic, logical, strategic aptitudes that can be fully realized within culture. Thus we see another facet of human complexity that integrates animality (mammalian and reptilian) in humanity and humanity in animality.⁷ Relations between the three instances are not only complementary but also antagonistic, including well-known conflicts between the heart and reason. Correlatively, the triunic relation does not obey a *reason ↔ emotion ↔ impulse* hierarchy; there is an unstable, permutating, rotating relationship between the three. Rationality does not exercise supreme power. It is but one, competing, antagonistic authority among three in an inseparable triad; and it is fragile, it can be dominated, submerged, or enslaved by emotion or impulse. The murderous impulse can use the marvelous logical machine and technical rationality to organize and justify its dastardly deeds.

⁶ MacLean, P. D., "The triune brain," Smith, F. Q. ed. *The Neurosciences, Second Study Program*. Rockefeller University Press, New York, 1970.

⁷ As we have seen in the preceding chapter this leads to close association between intelligence and emotions, as clearly explained in the works of Damasio, A. *L'erreur de Descartes*. O. Jacob, Paris. Vincent, J.-M. *Biologie des passions*. O. Jacob, Paris.

2.4 The individual ↔ society ↔ species loop

And there is one more triad, an *individual* ↔ *society* ↔ *species* loop. Individuals are the products of a reproductive process proper to the human species, but this process requires the participation of two individuals. Interactions between individuals produce society and society, which testifies to the emergence of culture, retroacts on individuals by culture.



The individual can not be absolutized into the supreme point on this loop; and the same is true for society and species. On an anthropological level, society lives for the individual who lives for society; society and the individual live for the species which lives for the individual and society. Each term is both means and end: culture and society make it possible for individuals to fulfill themselves; interactions between individuals ensure the perpetuation of culture and the self-organization of society. Nevertheless, we can consider the fulfillment and free expression of individuals-subjects as our ethical and political plan, without considering it as the finality of the *individual* ↔ *society* ↔ *species* triad. Human complexity cannot be understood in dissociation from the elements that constitute it; **all truly human development means joint development of individual autonomies, community participations, and a sense of belonging to the human species.**

3. UNITAS MULTIPLEX: HUMAN UNITY AND DIVERSITY

Education of the future should be careful to not allow the idea of the unity of the human species to efface the fact of its diversity, or the idea of its diversity to efface its unity. There is human unity. There is human diversity. Unity goes beyond the biological features of the species *homo sapiens*. Diversity is more than the psychological, cultural, and social features of the human being. There is also a strictly biological diversity within human unity; there is a unity that is not only cerebral but also mental, psychological, emotional, and intellectual. Moreover, the most diverse cultures and societies have common generative or organizing principles. Understanding what is human means understanding our unity in diversity, diversity in unity. We must conceive the unity of the multiple, the multiplicity of the one.

Education should illustrate this *unity/diversity* principle in all spheres.

3.1 The individual level

There is genetic *unity/diversity* on the individual level. Every human being bears the human species in his own genes and genetically carries his own anatomical and physiological singularity. There is cerebral, mental, psychological, emotional, intellectual, and subjective *unity/diversity*: every individual bears within himself cerebrally, mentally, psychologically, emotionally, intellectually, subjectively the fundamental common qualities and at the same time his own cerebral, mental, psychological, emotional, intellectual, subjective singularity...

3.2 The social level

On the level of society, there is *unity/diversity* of language (all different but all derived from a common structure of double articulation, making us twins by language and separated by languages) social organization, and culture.

3.3 Cultural diversity and individual plurality

Yes, we say *Culture*, and we say *cultures*.

Culture is made of the totality of knowledge, skills, rules, standards, prohibitions, strategies, beliefs, ideas, values, and myths passed from generation to generation and reproduced in each individual, that control the existence of the society and maintain psychological and social complexity. There is no human society, either archaic or modern, without a culture, but every culture is singular. There is always culture in cultures, **but culture exists only through cultures.**

Technology—the wheel, the harness, the compass, the printing press...—migrated from culture to culture. The same is true for religious beliefs and secular ideas that emerged in a singular culture and were able to become universal. But each culture has its own specific capital of beliefs, ideas, values, and myths, particularly those that bind a singular community to its ancestors, its traditions, the dead.

Those who recognize the diversity of cultures tend to minimize or obscure human unity; those who acknowledge human unity tend to consider cultural diversity as secondary. It is on the contrary appropriate to conceive of a unity that ensures and encourages diversity, a diversity that fits into unity.

The double phenomenon of unity and diversity of cultures is crucial. Culture maintains human identity in that which is specific to it; cultures maintain social identities in that which is specific to them. Cultures are apparently self-enclosed in order to safeguard their singular identity. But in fact they are also open: they integrate skills and techniques, and also ideas, customs, foods, and individuals from outside. Assimilations from one culture to another are enriching. And cultural mixing can produce great creations like flamenco, South American music, raï. But when the destructive effect of technico-civilizational domination results in the disintegration of a culture it is a loss for all of humanity because it deprives us of cultural diversity, one of our most precious treasures.

The human individual himself is both one and multiple. As we said, every human being, like a point in a hologram, bears the cosmos within

himself. We should also see that every human being, even a person confined in the most ordinary life, is a cosmos in himself. He carries inner multiplicities and virtual personalities, endless imaginary characters, a polyexistence in the real and the imaginary, sleep and waking, obedience and transgression, ostensible and secret, and larval squirming in his bottomless caves and chasms. Everyone contains galaxies of dreams and fantasies, unsatisfied flights of desire and love, abysses of unhappiness, immensities of icy indifference, conflagrations of fiery stars, waves of hatred, mindlessness, flashes of lucidity, outbursts of dementia...

3.4 Sapiens ↔ demens

In the 21st century we should abandon the unilateral vision of human beings defined by rationality (*homo sapiens*) technology (*homo faber*) utilitarian activities (*homo economicus*) compulsory necessities (*homo prosaicus*). A human being is complex and bears bipolarized antagonistic qualities:

Sapiens and *demens* (rational and demented)
faber and *ludens* (worker and player)
empiricus and *imaginarius* (empirical and imaginative)
economicus and *consumans* (economical and consumer)
prosaicus and *poeticus* (prosaic and poetic)

The man of rationality is also a man of emotion, myth, and dementia (*demens*). The man of work is also the man of play (*ludens*). Empirical man is also imaginative man (*imaginarius*). Economical man is also a man of "consumption" (*consumans*). Man who is prosaic is also poetic, meaning a man of fervor, involvement, love, ecstasy. Love is poetry. A flourishing love floods the world in poetry, a lasting love irrigates daily life with poetry, a love that ends throws us into prose.

A human being does not live by rationality and technology alone; he extends himself, gives himself, dedicates himself in dance, trance, myth, magic, rite; he believes in the virtues of sacrifice; he often devotes his life to preparing his other life, beyond death. Everywhere men are engaged in intellectual, practical, technical activity that testifies to an empirico-rational intelligence; and everywhere festivals, ceremonies, cults and states of possession, exaltation, waste, "consumption," testify to *homo ludens*, *poeticus*, *consumans*, *imaginarius*, *demens*. Games, festivals, ritual activities are not leisure activities that get us back in shape for practical or working life. Beliefs in gods and ideas cannot be reduced to illusions or superstition, they are rooted deeply in anthropological depths, they touch the human being to the quick of his nature. There is a manifest or underground relation between psychism, affectivity, magic, myth, and religion. There is both unity and duality between *homo faber*, *homo ludens*, *homo sapiens*, and *homo demens*. The development of technical-empirical-rational learning has never annihilated the poetic, magical, mythical or symbolic knowledge of human beings.

3.5 Homo complexus

We are infantile, neurotic, frenzied beings and yet we are rational. That is truly the stuff that human beings are made of.

A human being is a reasonable unreasonable being who can be subdued and excessive. Subject to intense unstable affectivity, he smiles, laughs, and cries but is also able to understand objectively. He is serious and calculating but also nervous, anguished, playful, excited, ecstatic; he is a being of violence and tenderness, love and hate; a being invaded by the imaginary who can recognize the real, knows death and cannot believe it, spawns myth and magic but also science and philosophy. He is possessed by Gods and Ideas, but doubts the Gods and criticizes the Ideas; he is nurtured by verified knowledge and feeds on illusions and phantasms. And when the rupture of rational, cultural, material controls leads to confusion between objective and subjective, between real and imaginary, when there is hegemony of illusions, unleashed excess, then *homo demens* enslaves *homo sapiens* and subjugates rational intelligence to the will of his monsters.

Madness is not only a downfall or illness, it is a central problem for man. The theme of human folly was ineluctable for ancient philosophy, oriental wisdom, poets of all continents, moralists, Erasmus, Montaigne, Pascal, Rousseau. It vanished in the euphoric humanist ideology that consecrated man as regent of the universe, and consequently disappeared from the social sciences and philosophy.

Madness has not brought the human species to extinction (only the nuclear energies liberated by scientific reason, only the development of technical rationality to the detriment of the biosphere could wipe us out). And yet it seems that so much time has been wasted in rites, cults, intoxications, decorations, dances, and countless illusions... Despite all this lost time, technological and then scientific development has been fantastic: civilizations produced philosophy and science, Humanity dominated the Earth.

The progress of complexity has been made in spite of, with, and because of human folly.

The *sapiens* ↔ *demens* dialogic was creative while being destructive; thought, science, the arts were irrigated by deep forces of affectivity, by dreams, anxiety, desires, fears, hopes. This *sapiens* ↔ *demens* copiloting is common to all human creation. *Demens* inhibited but also encouraged *sapiens*. Plato already observed that *Dike*, wise law, is the daughter of *Hubris*, overweening pride.

Here blind rage breaks the columns of a temple of servitude—the taking of the Bastille—and there a cult of Reason feeds the guillotine.

Genius is possible because a human being is never totally prisoner of reality, logic (neo-cortex), the genetic code, culture, society. Research and discovery go forward in the gaping hole of uncertainty and undecidability. Genius emerges in the breach of the uncontrollable, precisely there where folly lurks. Creation bursts forth from the liaison between obscure psycho-affective depths and the bright flame of consciousness.

Education should show and illustrate the multiple facets of human Fate: fate of the human species, individual fate, social fate, historical

fate, all these fates mixed together and inseparable. One of the essential vocations of the education of the future will be the investigation and study of human complexity. It will lead to knowledge [*prise de connaissance*] that will give awareness [*prise de conscience*] of the common condition of all human beings; the very rich and necessary diversity of individuals, peoples, cultures; and our rootedness as *citizens of the Earth*...

CHAPTER IV

EARTH IDENTITY

"Only the wise man constantly keeps in mind the whole, never forgets the world, thinks and acts with relation to the cosmos."

Groethuysen⁸

"For the first time man has truly realized that he is an inhabitant of the planet, and perhaps he should think and act from a new aspect, not only an individual, family, genre, State or group of States aspect, but also a planetary aspect."

Vernadski

How can the citizens of the new millennium think about their problems and the problems of their times?

They must understand the *human condition* in the world, and the condition of the human world, which in the course of modern history has become the condition of the *planetary era*.

We entered the planetary era in the 16th century; at the end of the 20th century we have reached the stage of globalization.

Globalization as the present state of the planetary era means, in the first place, as the geographer Jacques Lévy so well expressed it, "the emergence of a new object, the world as such." But the more we are grasped by the world the more difficult it is for us to grasp it. In these times of telecommunications, computers, Internet, we are submerged by the world's complexity and bombarded with countless bits of information about the world that drown out the possibilities of intelligibility.

Which is why we cherish the hope of isolating a problem that is absolutely vital, that would subordinate all the other vital problems. But this *vital problem* is made up of the totality of vital problems, the complex inter-solidarity of uncontrolled problems, antagonisms, crises, processes. The planetary problem is a whole fed by multiple, conflictual, crisisal [*crisique*] ingredients; it encompasses, surpasses and feeds them in return.

The difficulty of knowing our World is aggravated by our mode of thought which has atrophied instead of developing the aptitude to contextualize and globalize, whereas in this planetary era we must conceive its globality, the whole-part relation, the multidimensionality, the complexity. Which brings us back to the reform of thought called for in Chapter II, the need to conceive the context, the global, the multidimensional, the complex.

The problem lies in complexity (the *productive/destructive* loop of mutual action of the parts on the whole and the whole on the parts). We

⁸ *N.B.*: Indicative translation retranslated from the French. In the absence of precise references to original sources, all citations are retranslated from the French and consequently inexact.

must hereafter conceive the unbearable complexity of the world, meaning we must simultaneously consider the unity and diversity, the complementarities and antagonisms of the planetary process. *The planet is not a global system it is a moving whirlwind with no organizing center.*

Our planet requires polycentric thought that can aim at a universalism that is not abstract but conscious of the unity/diversity of the human condition; a polycentric thought nourished by the cultures of the world. Educating for this thought is the finality of education of the future, which in the planetary era should work for an earth identity and conscience.

1. THE PLANETARY ERA

Contemporary science teaches us where we stand in the cosmic calendar: 15 billion years from an unspeakable catastrophe that gave birth to the cosmos, about five million years from the dawn of the hominization that differentiated us from other anthropoids, one hundred thousand years from the emergence of homo sapiens, ten thousand years from the beginning of history. And we are now entering the third millennium of the era known as Christian.

Human history began with a planetary diaspora across all the continents and in modern times entered the planetary era of communication between fragments of the human diaspora.

The diaspora of humanity did not produce a genetic split: pygmies, blacks, yellows, reds, whites all share the same basic human properties and belong to the same species. But the diaspora did produce an extraordinary diversity of languages, cultures, and experience, which is a source of innovation and creation in all realms. The treasure of humanity lies in its creative diversity, but the source of this creativity is its generative unity.

At the end of the European 15th century, Ming dynasty China and Mongol India were the most important civilizations on the Globe. Islam in Asia and Africa was the most widespread religion on earth. The Ottoman empire came out of Asia, spread across western Europe, annihilated Byzantium, threatened Vienna, became a great power in Europe. The Inca and Aztec empires reigned in the Americas; the splendors, monuments, and flourishing populations of Cuzco and Tenochtitlan outdid Madrid, Lisbon, Paris and London, modest capitals of emerging Western European nations.

And yet, in 1492, these small, young nations set out to conquer the Globe, and their adventures of war and death brought the five continents into communication and opened the planetary era, for better and for worse. Western European domination over the rest of the world provoked irremediable catastrophic cultural destruction and terrible enslavement for some civilizations, notably in the Americas. The planetary era opened and proceeded with violence, destruction, slavery, shameful exploitation of Africa and the Americas. Eurasian bacteria and viruses ran rampant in the Americas, cutting down whole populations with measles, herpes, flu, and tuberculosis, while native American syphilis treponema danced from sex to sex all the way to Shanghai. Europeans grew corn, beans, tomatoes, manioc, cocoa, tobacco, white and sweet potatoes brought from the

Americas. And brought sheep, cattle, horses, cereals, grape vines, olives and tropical plants like rice, yams, coffee, and sugar cane to those lands.

Planetarization developed with contributions from European civilization on those continents; arms, techniques, and concepts reached trading posts, outposts, enclaves. Industry and technology developed at a pace hitherto unknown to any other civilization. Economic growth, development of communications, integration of the subjugated continents into the world market influenced exceptional population movements amplified by generalized population growth.⁹ In the latter half of the 19th century, 21 million Europeans crossed the Atlantic to the Americas. Similar migrations took place in Asia, where Indians settled in East Africa and the Natal and Chinese merchants fanned out in Siam, Java, the Malay peninsula, California, British Columbia, New South Wales, and Polynesia.

In the 20th century, planetarization spawned two world wars and two international economic crises; since 1989 it has taken the form of the free market economy known as globalization. The global economy is an increasingly interdependent entity in which each of the parts has become dependent on the whole and, reciprocally, the whole is vulnerable to perturbations and mishaps affecting any of the parts. The planet has shrunk. It took Magellan three years to sail around the world (1519-22). An intrepid 19th century traveler took 80 days to go around the world by carriage, train, and steamship. At the end of the 20th century a jet does the tour in 24 hours. Moreover, anything and everything that happens can be instantly present on all points of the planet via television, telephone, fax, Internet...

The world is made more and more whole. Each part of the world is more a part of the world and the world as a whole is more present in each of its parts. This can be verified for nations and peoples, and also for individuals. Just as each point of a hologram contains the information of the whole of which it is part, every individual now receives or consumes information and substances from the whole universe. A European wakes up in the morning, turns on his Japanese radio, and hears what's happening around the world. Volcanic eruptions, earthquakes, coups d'État, international conferences reach his ear as he sips tea from Ceylon, India, or China, or drinks coffee from Ethiopia or South America. He slips on underwear made of Egyptian or Indian cotton, puts on a suit made of Australian wool treated in Manchester and Roubaix-Tourcoing, or jumps into American-style jeans and a leather jacket from China. His watch is Swiss or Japanese. His glass frames are made of Equatorial tortoise shell. In the heart of winter he can eat strawberries and cherries from Chile or Argentina, fresh green beans from Senegal, avocados and pineapple from Africa, melons from Guadeloupe. In his liquor cabinet he has Martinican rum, Russian vodka, Mexican tequila, American bourbon. In the comfort of his home he can listen to a German symphony directed by a Korean conductor, or watch a video of *La Bohème* starring the African-American Barbara Hendricks as Mimi and the Spaniard Plácido Domingo as Rodolfo.

While the European enjoys his planetary circuit of comfort and pleasure, many many Africans, Asians, and South Americans are stuck in a planetary circuit of poverty. They are struck in everyday life by price

⁹ Within one century the European population increased from 190 million to 423 million, the global population from 900 million to 1 billion 600 million.

fluctuations in the world market for cocoa, coffee, sugar, and raw materials produced in their countries. They have been chased from their villages by globalized processes originating in the West, notably the progress of industrialized monoculture. Self-sufficient peasants have become urban slum job-hunters. From now on their needs are expressed in money. They aspire to the life of comfort and pleasure they see in Western films and advertisements. They use aluminum or plastic dishes, drink bottled beer and Coca-Cola®, sleep on salvaged polystyrene foam slabs, and wear American-style T-shirts decorated with logos and witty sayings. They dance to syncretic music: American orchestrations of their traditional beat. For better or worse, every human being, rich or poor, north south east or west, unwittingly bears the entire planet inside himself. Globalization is obvious, subconscious, omnipresent.

Globalization is undeniably unifying. But we must say in the next breath that it is conflictual. *Globalizing unification increasingly provokes a counter-effect—Balkanization—its own negative.* The world is more and more one and ever more divided. Paradoxically, the planetary era itself encouraged and facilitated a generalized breakup into nation-states. In fact, emancipating demands of nationhood are stimulated by a movement of return to ancestral identity in reaction against the planetary current of civilizational homogenization, and these demands are intensified by the generalized crisis of the future.

Various antagonisms feed each other: antagonisms between different nations and religions, between the secular and the religious, between modernity and tradition, democracy and dictatorship, rich and poor, between North, South, East, and West. And this combines with antagonistic strategic and economic interests of great powers and profit-seeking multinationals. All of these antagonisms meet in zones of interference and fracture like the great seismic zone that crosses the Globe from Armenia/Azerbaijan, through the Middle East, and all the way to Sudan. These antagonisms are aggravated where different religious and ethnic groups live side by side, where arbitrary frontiers divide nations, where all sorts of rivalries and denials create tensions, as in the Middle East.

In the 20th century, a unique planetary tissue was simultaneously formed and torn apart; the irritated isolated fragments fight each other. Nations dominate the world scene, acting like brutal drunken titans, powerful and powerless. And a techno-industrial wave sweeps over the Globe, washing away so many cultural, ethnic, human diversities. Development itself has caused more problems than it solved, and has left prosperous Western societies in a deep crisis of civilization.

Development conceived exclusively as techno-economic progress, including durable development, is in the long term unsustainable. We need a more rich and complex notion of development which is not only material but also intellectual, emotional, moral...

The 20th century has not left the planetary Iron Age, it is mired in it.

2. THE 20TH CENTURY LEGACY

The 20th century was marked by the alliance of two barbarous systems. The first rises up from the depths of time, bringing fanaticism, war, deportation, massacres. The second, cold, faceless, and obsessively calculating, comes from a rationalization that neglects individuals, their bodies and souls and feelings, and churns up the techno-industrial forces of servitude and death.

To get beyond this barbarian age we must first recognize its legacy. A double heritage of death and birth.

2.1 The legacy of death

It would seem that the 20th century confirms the dire saying that *human evolution is growth of the power of death*.

The death introduced by the 20th century is more and worse than just the death of tens of millions killed in two world wars and in Nazi and Soviet extermination camps. It is the age of two new death forces.

2.1.1 Nuclear weapons

The first death force is the potential global death of all humanity by nuclear weapons. This danger is still not dissipated as we enter the third millennium. On the contrary, it has increased with the proliferation and miniaturization of the bomb. Hereafter, the potential for self-annihilation walks side by side with humanity.

2.1.2 New perils

The second death force is potential ecological death. Since the 70s we have realized that waste, emanations, and exhalations from our urban techno-industrial development degrade the biosphere and threaten our living environment with irremediable poisoning. The frantic domination of Nature by technology is suicidal for humanity.

Elsewhere, deathly forces that we thought we had eradicated are rebelling, the AIDS virus stalks us, other terrible new viruses and bacteria that were tamed or almost eliminated strike back in new antibiotic-resistant strains. Death is violently reintroduced into bodies that we believed to be aseptic.

Death has gained ground within our souls. Our latent forces of self-destruction are exacerbated and succumb to the sirens of hard drugs such as heroin and cocaine wherever solitude and anxiety flourish.

The menace of death hangs over us in thermonuclear weapons, wraps us in a degraded biosphere, lurks in the heart of our intimate contacts, crouches in our souls with the deathly appeal of drugs.

2.2 Death of modernity

The civilization created in the West cast off its moorings and headed for what was thought to be infinite progress. It advanced with concomitant developments in science, reason, history, economy,

democracy. But we learned, with Hiroshima, that science is ambivalent; we saw reason regress and Stalinist madness masked in historical reason; we have recognized that there are no laws of History leading us ineluctably to a radiant future; we realize that the triumph of democracy was nowhere permanently ensured; we have seen that industrial development can entail cultural ravages and deathly pollution; we have seen that the civilization of well-being can at the same time produce ill-being. If modernity is defined as unconditional faith in progress, technology, science, and economic development, then that modernity is dead.

2.3 Hope

Because the *brain ↔ mind* dialogic of humankind is not closed, because it carries the necessary resources for creation, we can glimpse the potential of a new creation—*earth citizenship*—in the third millennium, born of seeds and embryos contributed by the 20th century. And education, which both transmits the old and opens the mind to the new, is at the heart of this new mission.

2.3.1 Contribution of countercurrents

The 20th century belatedly bequeathed regenerative countercurrents. Countercurrents have often developed in reaction to dominant currents and changed the course of events. The following are noteworthy:

- The ecological countercurrent, which will inevitably gather force in reaction to the increase in environmental damage and technological/industrial catastrophes.
- The qualitative countercurrent is a reaction against the predominance of the quantitative and the general tendency to uniformity; it values quality in all realms, beginning with the quality of life.
- The countercurrent of resistance against strictly utilitarian prosaic life is demonstrated by a search for a poetic life devoted to love, delight, passion, festivity.
- The countercurrent of resistance against the dictates of standardized consumption operates in two contrasting ways: a search for intense experience (the consummate), or a discipline of temperance and frugality.
- An as yet timid countercurrent of emancipation from the omnipresent tyranny of money is expressed by efforts to resist the reign of profit and counterbalance it with human solidarity.
- Another timid countercurrent in reaction against unleashed violence is sustained by an ethics of pacification of minds and souls.

And we dare to imagine that the cheated and disappointed aspirations of the great 20th century revolutionary hopes will relive in new forms of unity and responsibility. Further, we hope that today's dispersed fragments of humanity fired by a need to reconnect with their origins and fully assume national or ethnic identities will find a way, without denying their own truths, to deepen and expand this movement and connect with their origins and identity as human beings and citizens of our *Earth-Homeland*.

Finally, we might have hopes for politics in the service of human beings, inseparable from a politics of civilization that will lead the way to a civilized Earth, humanity's common home and garden.

During the 21st century, all of these countercurrents are promised to intensify and expand into multiple beginnings of transformation; but true transformation cannot be accomplished until these currents inter-transform each other, performing a global transformation that will retroact on the transformations of each and every one.

2.3.2 *In the contradictory game of possibles*

One of the fundamental conditions for positive evolution is for the liberating forces inherent in science and technology to surmount the forces of death and servitude. Technoscientific developments are ambivalent. They have shrunk the Earth, bringing all points of the Globe into instant communication; they provide the means to give all the inhabitants of our planet a minimum of nourishment and welfare; but they have created the worst conditions of death and destruction. Human beings enslave machines that enslave energy but at the same time are enslaved by them. Dan Simmons' science fiction saga *Hyperion* portrays a future millennium when humans, unawares, will be domesticated by A.I.s (artificial intelligences) prepared to eliminate them. The astonishing science fiction adventure ends with a declaration of the new wisdom by a human/A.I. hybrid endowed with the soul of the poet Keats. This is the crucial problem facing us since the 20th century: will we submit to the *technosphere* or live in symbiosis with it?

Biotechnological development is another prodigious source of the best and the worst possibilities. Genetics and molecular manipulations of the human brain will open the way to normalization and standardization of the human species beyond anything ever accomplished by indoctrination and propaganda. But they will also help eliminate handicapping defects, promote the practice of predictive medicine, and give the mind control of its brain.

The current scope and rapid pace of transformations would suggest that we are undergoing a mutation far greater than the passage from small archaic hunting-gathering communities with no State, agriculture, or towns in the pre-historic Neolithic, to our historical era societies which have been spreading across the planet for the past eight millennia.

We can also count on the inexhaustible sources of human love. Certainly the 20th century has suffered terribly from indifference, hardness, cruelty, and lack of love. But it has also produced excesses of love dedicated to lying myths, illusions, and false divinities or petrified in petty fetishisms like stamp collecting.

We can also place hope in yet unexploited human cerebral possibilities; the human mind could develop hitherto unknown aptitudes for intelligence, understanding, creativity. Since social potential is related to cerebral potential, no one can be sure that our societies have exhausted their potential for transformation and that we have come to the

end of history. We can hope for progress in relations between human beings, individuals, groups, ethnic groups, nations.

The spiritual, cultural, sociologic and anthropologic potential for progress restores the principle of hope, but without "scientific" certainty or "historical" promise. It is an uncertain potential heavily dependent on awareness, determination, courage, luck... Awareness has become urgent and primordial.

The worst dangers and the greatest hopes are borne by the same function: the human mind itself. And this is why the reform of thought has become a vital necessity.

3. EARTH IDENTITY, EARTH AWARENESS

The minimal rational demand of a shrunken interdependent world is planetary union. This union requires an awareness and feeling of mutual belonging that connects us to our *Earth*, considered as the first and ultimate *Homeland*.

If the notion of homeland bears a common identity, a relation of affective filiation to a substance that is both maternal and paternal (in the feminine-masculine French word "*patrie*") and a common fate, then the notion of *Earth-Homeland* can be proposed.

As noted in Chapter III, we all share a common genetic, cerebral, emotional identity through and beyond our individual, cultural, and social diversities. We are the development of a form of life born of the Earth's womb and nurtured by the Earth. And now, since the 20th century, all human beings have the same basic life and death problems, all are connected in the same planetary community, sharing a common fate.

We have to learn to place our "being there" on the planet. Learning to be there means learning to live, share, communicate, commune; things that used to be learned only in and by singular cultures. Henceforth we have to learn to be, to live, share, communicate, commune as humans of Planet Earth. Not to be in one culture alone, but to be earth people as well. We have to stop trying to get mastery and learn to manage, improve, understand. We have to inscribe in ourselves:

- ◆ *An anthropological conscience* that recognizes our unity in diversity.
- ◆ *An ecological conscience*, aware that we inhabit, with all mortal beings, the same living sphere (biosphere). Recognizing our consubstantial bond with the biosphere we can give up the Promethean dream of dominating the universe and nurture our aspiration for conviviality on this earth.
- ◆ *An earthling civic conscience*, a feeling of solidarity with the children of the Earth and responsibility for them.
- ◆ *A spiritual conscience of the human condition*, acquired through the exercise of complex thought that opens us to inter-criticism, self-criticism, and inter-understanding.

We must stop teaching the opposition between the universal and the homeland, and concentrically link our familial, regional, national, European homelands and integrate them into a concrete universe of the earth homeland. We must stop contrasting a radiant future with a past of servitude and superstition. All cultures have virtues, experience, wisdom,

and they all have shortcomings and ignorance. A human group has to draw on its sources in the past to find the energy to face the present and prepare the future. Striving for a better future should be complementary and no longer antagonistic with drawing on sources in the past. The life of every human being, every community, should be irrigated with this constant circulation between the past where identity is restocked by attachment to forebears, the present where needs are asserted, and a future toward which aspirations and efforts are projected.

Here, our States can play a decisive role on condition that they agree in their own interest to abandon absolute sovereignty over the great problems of common utility, and particularly the life and death problems that are outside the pale of their isolated competence. At any rate, *Nation-States endowed with absolute power are now and forever barren*; instead of trying to disintegrate them we should show our respect by integrating them into totalities and making them respect the totality to which they belong.

The confederated world should be not only politically but also culturally polycentric and acentric. The provincialized Occident feels a yearning for Orient; the Occidentalizing Orient tries to hold onto itself. The North has developed calculation and technology and lost the quality of life; the technically backward South still cultivates the qualities of life. A dialogic should now complementarize North, South, East, and West.

Connectedness [*reliance*] should replace disjunction and bring about "symbiosophy," the wisdom of living together.

Unity, mixing, and diversity should counter uniformity and closure. Inter-marriage is not only the creation of new diversities from an encounter of differences; in the planetary process it becomes product and producer of connectedness and unity. It introduces complexity in the heart of the mixed (cultural or racial) identity. Of course everyone may and should, in the planetary era, cultivate his poly-identity and make it the site of integration of other identities: familial, regional, ethnic, religious or philosophic, continental, and earthly. Children of mixed marriages can find in the roots of their poly-identity familial, ethnic, national, or continental bipolarity on which to build a complex thoroughly human identity.

The anthropological double imperative imposes: save human unity and save human diversity. Develop our identities which are both concentric and plural; our ethnic, homeland, community of civilization identity, and our citizens of the earth identity.

On the level of planetary humanity we are engaged in the essential task of life which is to resist death. Today, the fundamental global objective of all education aspiring not only to progress but to the survival of humanity is to Civilize and Unify the Earth and Transform the human species into genuine humanity. Awareness of our humanity in this planetary era should lead us to a new unity and reciprocal commiseration from each to each, from all to all. *The education of the future should teach an ethics of planetary understanding.*¹⁰

¹⁰ See Chapter VI below.

CHAPTER V

CONFRONTING UNCERTAINTIES

"The gods give us many surprises: the expected does not occur and they open the door to the unexpected."

Euripides

We have still not incorporated this message from Euripides: expect the unexpected. And yet the waning years of the 20th century have given us ample reason to recognize the irremediable uncertainty of human history.

In preceding centuries people believed that the future would be a repetition of the past, or they believed in progress. The 20th century lost the future by discovering that it is completely unpredictable. This awareness calls for another retroactive or correlative awareness: human history has been and remains an unknown quantity. If we could finally get rid of the illusion that we can predict the course of human events, it would be a major intellectual conquest. The future remains open and unpredictable. Of course sociologic, economic and other determinations influence the course of history, but they have always been in an unstable uncertain relation with the countless hazards and accidents that change its direction.

Traditional civilizations lived in the certainty of cyclic time and believed that sacrifice, sometimes human sacrifice, was necessary to ensure its proper functioning. Modern civilization lived in the certainty of historical progress. And today, the collapse of the myth of Progress brings us awareness of historic uncertainty. Some progress is of course possible, but it is uncertain. This is compounded by uncertainties related to the speed and acceleration in our planetary era of complex random processes that no human mind or supercomputer or Laplace demon could encompass.

1. HISTORICAL UNCERTAINTY

Who thought in the spring of 1914 that an assassination in Sarajevo would ignite a world war that would last four years and make millions of victims?

Who thought in 1916 that the Russian Army would fall apart and a small marginal Marxist party would disregard its own doctrine and precipitate a Communist revolution in October 1917?

Who thought that the peace treaty signed in 1918 carried the seeds of a second world war that would break out in 1939?

Who thought in the prosperous year of 1927 that an economic catastrophe that started on Wall Street in 1929 would engulf the planet?

Who thought in 1930 that Hitler would take power by legal means in 1933?

Who, aside from a few dreamers, thought in 1940-41 that the iron fisted Nazi domination of Europe and the smashing progress of the Wehrmacht all the way to the gates of Leningrad and Moscow in the USSR, would be followed in 1942 by a total reversal of the situation?

Who thought in 1943, at the height of the alliance between the Soviets and Western powers, that three years later those same allies would be Cold War enemies?

Who thought in 1980, aside from a few visionaries, that the Soviet empire would implode in 1989?

Who in 1989 imagined the Gulf War and the conflicts that would break up Yugoslavia?

Who, in January 1999, imagined air strikes against Serbia in March 1999 and who, as these lines are being written, can measure the long term consequences?

As these lines are being written, no one can answer these questions that may well remain unanswered during the 21st century. As Patocka observed, "From now on the future is problematized, and it will forever be so." The future's name is uncertainty.

2. CREATIVE, DESTRUCTIVE HISTORY

The emergence of the new cannot be predicted, otherwise it would not be new. The emergence of a creation cannot be known in advance, otherwise it would not be creation.

History does not flow majestically like a wide river; it meanders around innovations, internal creations, external events, accidents. Internal transformation begins with creations arising within a small circle as tiny local events which are considered deviant. If the deviation is not snuffed out it may under favorable conditions, often a state of crisis, paralyze the regulations that block or repress it, and proliferate like an epidemic; it develops, propagates, gains momentum, becomes a strong trend and finally produces a new normality. This is the way it happened for all technical inventions from the harness, compass, printing press, steam engines, movies, up to computers. This was the way it happened for capitalism in Renaissance city-states. And the same is true of all the great universal religions born from the singular preaching of a Siddharta, Moses, Jesus, Mohammed, Luther; and all the great universal ideologies hatched in the minds of a handful of misfits.

Despotic and totalitarian powers, aware that individuals carrying difference are a source of potential deviation, quickly eliminate them and wipe out tiny centers of deviation. But sooner or later the despotism softens and deviation makes its way; it may reach the highest echelons of the State, unexpectedly emerging in the mind of a new sovereign or General Secretary.

All development is the fruit of successful deviation that flourishes, and changes the system within which it arose; it disorganizes the system in reorganizing it. Major transformations are morphogeneses; the new forms they create may lead to authentic metamorphoses. Whatever the circumstances, development is inevitably disorganizing/reorganizing in its process of transformation or metamorphosis.

Transformation is not only innovation and creation, it is also destruction. This may come from innovations: developments of technology, industry, and capitalism led to the destruction of traditional civilizations. Conquest and extermination from exterior forces brought brutal massive destruction to the empires and cities of Antiquity. The

16th century Spanish conquest was a total catastrophe for Inca and Aztec empires and civilizations. The 20th century witnessed the collapse of the Ottoman and Austro-Hungarian empires, and the implosion of the Soviet empire. And many acquisitions are irremediably lost as the result of historical cataclysms. So much knowledge, so many philosophical works and literary masterpieces contained in books have been destroyed along with those books. Integration of acquired human experience is so fragile and the losses are so heavy; a significant portion of this experience is dissipated in each passing generation. There is a tremendous loss of acquired experience down through history. Whereas many beneficial ideas that could well be integrated are instead rejected because of prevailing standards, taboos, prohibitions.

History tells the tale of astonishing creations, such as the emergence of democracy and philosophy in Athens five centuries before our era, and terrible destructions of societies and even civilizations.

The development of history is not linear. It is full of turbulence, bifurcations, detours, periods of static immobility, periods of latency followed by virulence as when Christianity submerged the Roman empire after six centuries of incubation, periods of rapid epidemic processes like the propagation of Islam. History is a tangle of jostled stories, unpredictable and uncertain; it develops and shrinks, goes forward and backward, stops and starts. And, as we have seen, when history became planetary it spawned totalitarian convulsions and two world wars in the 20th century. History is a complex of order, disorder, and organization, full of sound and fury, subject to chance and determinism. History has contradictory faces: civilization and barbarity, creation and destruction, generating and death-dealing...

3. AN UNCERTAIN WORLD

The uncertain adventure of humanity is simply the continuation of the uncertain adventure of the cosmos, created from an accident that defies our imagination, and pursuing its course of creations and destructions.

At the close of the 20th century we had learned that the vision of a faultlessly ordered universe should be replaced by a vision in which this universe is the game and the outcome of a dialogic (an antagonistic, competitive, complementary relation) between order, disorder, and organization.

The Earth itself, which probably originated in a pile of cosmic refuse spit out from a solar explosion, is self-organized in a dialogic between *order ↔ disorder ↔ organization*, victim of eruptions, earthquakes, and violent shocks from meteorites, including one which may have ripped out the moon.¹¹

4. CONFRONTING UNCERTAINTIES

A new consciousness is emerging. Confronted by uncertainties on all sides, man is swept up in a new adventure. We have to learn how to confront uncertainty because we live in a changing epoch where our

¹¹ See Chapter III above, 1.3 "The earthly condition."

values are ambivalent and everything is interconnected. This is why the education of the future must review the uncertainties connected with knowledge (cf., Chapter II), in the light of:

- ◆ A principle of *cerebro-mental uncertainty* that follows from the process of *translation/reconstruction* proper to all knowledge.
- ◆ A principle of *logical uncertainty*, as clearly described by Pascal: "neither is contradiction the mark of falsity, neither is non-contradiction the mark of truth."
- ◆ A principle of *rational uncertainty* because rationality that does not maintain self-critical vigilance turns into rationalization.
- ◆ A principle of *psychological uncertainty* due to the impossibility of being totally aware of what happens in the machinery of our mind, where some part of the functioning remains unconscious. This makes critical self-examination difficult; our sincerity is an insufficient guarantee of certainty, and there are always limits to self-knowledge.

The abundance of dramatically interconnected problems gives us a picture of a world that has gone beyond crisis to that violent state called *agony*, where the forces of life and the forces of death are squared off. Despite their solidarity human beings are enemies to each other; waves of hatred between races, religions, ideologies still engulf humanity in war, massacres, torture, hatred, scorn. Processes destroy an ancient world, here multimillennial, there multacentenary. Human beings do not know how to give birth to Humanity. We don't know yet if we are in the last agony of an old world, prelude to a new birth, or locked in mortal agony. A new conscience is emerging: humanity is swept up in an unpredictable adventure.

4.1 Uncertainty of reality

Reality is not easily legible. Ideas and theories are not a reflection of reality they are translations, and sometimes mistranslations. Our reality is nothing more than our idea of reality.

So we should not be realistic in a trivial way (bending to immediacy) nor unrealistic in a trivial way (escaping from the constraints of reality); we should be realistic in a complex way, understanding the uncertainty of reality, knowing that the real holds invisible potential.

This shows us that we must know how to interpret reality before we can recognize where realism lies.

Again, we come to uncertainties about reality that can strike realism with uncertainty or reveal that what seemed unrealistic was realistic.

4.2 Uncertainty in knowledge

Learning is indeed an uncertain adventure which in itself permanently entails the risk of illusion and error.

While the worst illusions are found within intolerant, dogmatic, doctrinaire certainties, awareness of the uncertain nature of cognitive acts is on the contrary the opportunity for pertinent knowledge that demands investigation, verification, and converging indications. To solve a crossword puzzle you have to find the exact word that matches the

definition and fits in with the other words that share its letters; general agreement between all the words constitutes an overall verification that confirms the choice of each separate word. But in life, unlike crossword puzzles, there are boxes without definitions, boxes with false definitions, and no neat framework to define the limits. Certainties can only be established when the details can be isolated, framed, and treated as classifiable elements as in the Mendeleev table. Once again, we repeat, learning is navigation on a sea of uncertainties dotted with islets of certainties.

4.3 Uncertainties and the ecology of action

We sometimes have the impression that action makes things simple because, faced with an alternative, we decide, we make a choice. Action is decision. But it is also a wager, and in the notion of betting there is awareness of risk and uncertainty.

This is where the notion of *ecology of action* comes in. As soon as a person begins any action whatsoever, the action starts to escape from his intentions. It enters into a sphere of interactions and is finally grasped by the environment in a way that may be contrary to the initial intention. So we have to follow the action and try to correct it if it is not too late, or sometimes shoot it down, like NASA exploding a rocket that has veered off course.

Ecology of action means taking into account the complexity it posits, meaning random incidents, chance, initiative, decision, the unexpected, the unforeseen, and awareness of deviations and transformations.¹²

One of the greatest acquisitions of the 20th century was the formulation of theorems limiting knowledge in reasoning (Gödel's theorem, Chaitin's theorem) and action. In this realm we should mention Arrow's theorem which states the impossibility of arriving at the collective interest by aggregating individual interests, or of defining collective satisfaction on the basis of aggregate individual contentments. And more broadly there is the impossibility of setting up an algorithm of optimization in human problems: the search for optimization goes beyond all available searching power and the search for an optimal finally turns into the non optimal or even the worst case. This leads us to a new uncertainty between seeking the greatest good and the least bad.

Von Neumann's game theory demonstrates that for any case beyond a duel between rational participants it is impossible to know with certainty the best strategy. It so happens that the games of life are rarely limited to two players, and the players are even more rarely rational.

So we are confronted with a great uncertainty from what we call the ecology of action, which includes four principles.

4.3.1 The risk ↔ caution loop

This is the uncertainty principle that comes from the dual necessity of risk and caution. Every act undertaken in an uncertain environment bears a contradiction between the principles of risk and caution, both of which are necessary. The question is how to connect them in spite of

¹² Cf., Morin, E. *Introduction à la pensée complexe*, ESF éditeur, Paris, 1990.

their opposition. In the words of Pericles, "we know how to be very bold and yet undertake nothing without ripe reflection. For others, boldness comes from ignorance and reflection leads to indecision" (Thucydides, *The Peloponnesian War*).

4.3.2 The ends ↔ means loop

This is the uncertainty principle of ends and means. Since ends and means inter-retro-act on each other, base means put to noble ends almost inevitably pervert them and finally replace them. Enslavement used as a means for liberating ends not only contaminates them but also self-finalizes. Having perverted the socialist project, the Cheka self-finalized, successively becoming the GPO, NKVD, KGB, a supreme police power designed for self-perpetuation. Notwithstanding, trickery, lies, and force in the service of a just cause may save it without contaminating it, on condition of being temporary exceptional measures. Conversely, perverse actions can, precisely by the reactions they provoke, lead to a fortunate outcome. So it is not absolutely certain that the purity of means leads to the desired ends, or their impurity to bad results.

4.3.3 The action ↔ context loop

Every action escapes the will of its initiator by entering into the play of inter-retro-actions of the environment in which it occurs. This is the ecology of action principle. Action risks failure but also risks diversion or perversion of its initial meaning, and may even turn against its initiators. The revolution precipitated in October 1917 did not result in a dictatorship by the proletariat but a dictatorship over the proletariat. More generally, both paths to socialism—the social-democrat reform path and the Leninist revolutionary path—led to something altogether different from their expressed finalities. The establishment of Juan Carlos in Spain, in line with Generalissimo Franco's intention to consolidate his despotic order, contributed on the contrary to leading Spain to democracy.

Action may produce three kinds of unforeseen consequences, as enumerated by Hirschman:

- ◆ Perverse effect (the unexpected harmful effect is greater than the hoped-for beneficial affect).
- ◆ Innovational inanity (more of the same [*plus ça change, plus c'est la même chose*]).
- ◆ Imperiling acquisitions obtained (the wish was to improve society but the result was suppression of liberties or security). The harmful, vain, perverse effects of the 1917 October Revolution were manifest in the Soviet experience.

5. LONG TERM UNPREDICTABILITY

One may of course envisage or compute the short term effects of an action but the long term effects are unpredictable. The chain of consequences after 1789 was unexpected. The Terror, Thermidor, the Empire, the reestablishment of the Bourbons and more generally the European and worldwide consequences of the French Revolution were

unpredictable all the way up to and including October 1917, just as the consequences of October 1917 were unpredictable from the formation to the fall of the totalitarian empire.

No action is assured of working in the direction of its intention.

However, the ecology of action does not invite inaction but a good wager with awareness of risks, and a flexible strategy that can modify or cancel the action.

5.1 Wager and strategy

There are effectively two ways to confront the uncertainty of action. The first is full awareness of the wager involved in the decision, the second is recourse to strategy.

Once the thoughtful decision is made, full awareness of uncertainties becomes full awareness of a wager. Pascal recognized that his faith was a wager. The notion of wager should be extended to all faith, faith in a better world, faith in fraternity or justice, and all ethical choices.

Strategy should prevail over program. A program sets up a sequence of actions to be executed without variation in a stable environment but as soon as the outside conditions are modified, the program gets stuck. Whereas strategy elaborates a scenario of action based on an appraisal of the certainties and uncertainties, the probabilities and improbabilities of the situation. The scenario may and must be modified according to information gathered along the way and hazards, mishaps or good fortune encountered. We can use short program sequences within our strategies. But for things done in an unstable uncertain environment, strategy imposes. It should privilege caution sometimes, sometimes audacity and, if possible, both at once. Strategy can and should often make compromises. To what extent? There is no general answer to this question but, there again, there is risk: the risk of intransigence that leads to defeat, or extreme flexibility that leads to abdication. The problem of the dialogic between ends and means is always raised in strategy in a singular way, according to the context, and by virtue of its own development.

And finally we must consider the difficulties of strategy in the service of a complex finality, such as that indicated by the motto "liberty, equality, fraternity." These three complementary terms are at the same time antagonistic: liberty tends to destroy equality; equality, if imposed, tends to destroy liberty; fraternity cannot be decreed or imposed, only encouraged. Depending on the historical conditions, strategy should favor either liberty, equality, or fraternity, without ever really rejecting the other two terms.

In conclusion, the answer to the uncertainties of action is thoughtful decision, awareness of the wager, and elaboration of a strategy which allows for the complexities inherent in its finalities; can be modified in the course of action in response to chance, information, change of context; and provides for eventual torpedoing of an action that may have taken a harmful course. This is how we can and should combat the uncertainties of action. These uncertainties can be surmounted in the short or medium term, but no one can claim to have eliminated them in the long term.

Strategy, like learning, is navigation on a sea of uncertainties dotted with islets of certainties.

Then we can realize that the wish to liquidate Uncertainty is an illness of our minds, and the hunger for great Certainty is a symptom of imaginary pregnancy.

Thought should be armed and battle-ready to confront uncertainty. Everything that involves chance involves risk, and thought should recognize the chance of risks as the risk of chances.

Giving up on progress guaranteed by the "laws of History" does not mean giving up on progress but recognizing its fragile uncertainty. Renouncing the best of all worlds does not at all mean renouncing a better world.

Alas we have often seen the possible become impossible in history, and we have a premonition that the richest human possibilities are still unrealized. But we have also seen the unhopèd-for become possible and fulfilled; we have often seen the improbable come true instead of the probable. Let us know how to hope for the unhopèd-for and strive for the improbable.

CHAPTER VI

UNDERSTANDING EACH OTHER

Our situation on this Earth is paradoxical. Interdependence is multiplied. Awareness of being united in life and death connects us to each other. Communication is triumphant, the planet is crisscrossed with networks, fax lines, portable phones, modems, Internet. And yet general incomprehension is still the rule. Of course we have witnessed tremendous progress in understanding each other. But incomprehension seems to progress even faster.

The problem of understanding has become crucial for human beings. This is why it should be one of the finalities of education in the future.

We must not forget that no technique of communication—from telephone to Internet—can in and of itself bring understanding. Understanding cannot be digitalized. Teaching the basics of mathematics or some other discipline is one thing, educating for human understanding is another. There we touch on the truly spiritual mission of education: teaching understanding between people as condition and protection of humanity's moral and intellectual solidarity.

The problem of understanding is double-edged:

- ◆ Understanding between human beings, which has taken planetary proportions with the enormous increase in encounters and relations between people, cultures, and people from different cultures.
- ◆ Individual understanding between closely related people in private relations which are increasingly menaced by incomprehension (as will be indicated below). There is some truth to the maxim that says, "the closer you are the better you understand each other." But the contrary is also valid: "the closer you are, the less you understand each other." Proximity can feed misunderstanding, jealousy, and aggressiveness at all levels of society, including those that are apparently the most highly developed intellectually.

1. TWO TYPES OF UNDERSTANDING

Communication does not bring understanding.

Information, if properly transmitted and understood, brings intelligibility, which is the first required though insufficient condition for understanding.

There are two types of understanding: intellectual or objective, and human intersubjective. To understand [*comprendre*] means to intellectually apprehend together, *com-prehendere*, to grasp together (the text and its context, the parts and the whole, the multiple and the single). Intellectual comprehension operates through intelligibility and explanation.

Explanation implies considering the element to be known as an object and applying objective means of knowledge to it. Explanation is of course necessary for intellectual or objective comprehension.

Human understanding is beyond explanation. Explanation is adequate for objective or intellectual comprehension of anonymous or material things. It is inadequate for human understanding.

Human understanding implies subject-to-subject knowledge. If I see a child crying, I am not going to understand his tears by measuring their salt content but by finding my own childish distress deep inside, by identifying him with me and me with him. We do not only perceive others objectively, we perceive them as other subjects with whom we identify and whom we identify with ourselves, an *ego alter* that becomes an *alter ego*. Understanding necessarily includes a process of empathy, identification, and projection. Understanding, always intersubjective, demands an open heart, sympathy, generosity.

2. TEACHING OBSTACLES TO UNDERSTANDING

The exterior obstacles to intellectual or objective comprehension are numerous.

Understanding the meaning of the other's words, his ideas, his world view, is always, everywhere endangered by a variety of factors:

- ◆ "Noise" parasites information transmission, causing misunderstanding or non-understanding.
- ◆ The polysemy of notions that are stated with one meaning and heard with another. For example, the word "culture" is a conceptual chameleon: it can mean that which is learned and acquired because it is not innate; it can mean the customs, values, and beliefs of an ethnic group or a nation; it can mean everything contributed by the humanities; literature, art, and philosophy.
- ◆ Ignorance of the rites and customs of others, namely rites of courtesy, may lead to unknowingly insulting the other or disgracing oneself.
- ◆ Incomprehension of the imperative values held within another culture; for example, religious faith, respect for the elderly, unconditional obedience from children in traditional societies; or on the contrary the cult of the individual and respect for liberties in our contemporary democratic societies.
- ◆ Incomprehension of ethical imperatives in a given culture: the imperative of vengeance in tribal societies, the imperative of the law in developed societies.
- ◆ It is often impossible to understand the ideas or arguments of another world view from within one's own world view, just as it is difficult within one philosophy to understand another philosophy.
- ◆ And especially because of the impossibility of comprehension from one mental structure to another.

Tremendous internal obstacles stand before both types of understanding: indifference, but also egocentrism, ethnocentrism, sociocentrism—different levels of a common propensity to place oneself at the center of the world and consider everything that is distant or foreign as secondary, insignificant or hostile.

2.1 Egocentrism

Egocentrism maintains self-deception engendered by self-justification, self-glorification, and the propensity to project onto others, foreign or not, the cause of all ills. Self-deception is a complex rotating game of lies, sincerity, conviction, and duplicity that leads to a pejorative perception of the words and deeds of others; we choose whatever is unfavorable and reject what is favorable to them; we choose our gratifying memories and reject or transform the dishonorable ones.

In *The Circle of the Cross*, Iain Pears gives four different accounts of the same events and one murder, showing that the different stories are incompatible not only because of lying and dissimulation but also because of preconceived ideas, rationalization, egocentrism, and religious beliefs. *La féerie pour une autre fois*, by Louis-Ferdinand Céline, is an exemplary piece of frantic self-justification by an author totally incapable of self-criticism, indulging fully in paranoid reasoning.

In fact, incomprehension of oneself is an important source of incomprehension of others. When a person hides his own weakness and failings, he is merciless for the weakness and failings of others.

We witness an increase in egocentrism concomitant with liberation from constraints and obligations which in the past forced people to sacrifice individual desires that went against the desires of parents or partners. Today, relations between parents and children, husbands and wives, are ravaged by incomprehension. It spreads like cancer in daily life, causing calumny, violence, psychic murders (wishes for death). Relations among intellectuals, writers, and scholars, people who should understand each other exceptionally well, are thoroughly spoiled by generalized ego hypertrophy caused by hunger for fame and recognition.

2.2 Ethnocentrism and sociocentrism

These centrisms feed xenophobia and racism, sometimes to the point of treating foreigners as if they weren't human beings. The fight against all forms of racism would be more effective if it were aimed at the ego-sociocentric roots, not the superficial symptoms.

Preconceived ideas, rationalization based on arbitrary premises, frantic self-justification, inability to self-criticize, paranoiac reasoning, arrogance, denial, contempt, fabrication and condemnation of offenders are the causes and consequences of the worst incomprehensions resulting from egocentrism and ethnocentrism.

Incomprehension produces as much dumbing as dumbing produces incomprehension. Indignation doesn't bother with study and analysis. As Clément Rosset observed, "disqualification for moral reasons is a way of avoiding the effort of knowing the disqualified subject, so a moral judgment always expresses a refusal to analyze and even to think."¹³ And as Westermarck remarked, "the distinctive quality of moral indignation remains the instinctive desire to give pain for pain."

The consequences of the inability to conceive a complex and the reduction of knowledge of a whole to knowledge of one of its parts are

¹³ Rosset, C. *Le démon de la tautologie, suivi de cinq pièces morales*: 68. Minuit, 1997.

even more drastic in the realm of human relations than in our knowledge of the physical world.

2.3 The reductive mind

When knowledge of a complex is brought down to knowledge of just one of its elements, deemed to be the only significant one, the consequences in ethics are worse than in physical knowledge. Yet it is this reductive, simplifying, dominant mode of thought, combined with mechanisms of incomprehension that reduces the naturally multiple personality to one of its features. If the feature is favorable, the person's negative aspects are ignored; if it is unfavorable, the positive features will be ignored. In both cases, there is incomprehension. Understanding demands, for example, that we not confine or reduce a human being to his crime or, if he has committed several crimes, to his criminality. As Hegel said: "Abstract thought sees nothing in the murderer but that abstract [taken out of its complex] quality, and with that single quality [destroys] the rest of his humanity."

And, lest we forget, possession by an idea or faith imparts absolute conviction of its truth and destroys the possibility of understanding another idea, another faith, another person.

Obstacles to understanding are multiple and multiform: the most serious arise from the *egocentrism* ↔ *self-justification* ↔ *self-deception* loop, from possession and reduction, and from revenge and vengeance. These rigid structures erected in the human mind cannot be dismantled but they can and must be surmounted.

The combination of intellectual, human, individual, and collective incomprehension is a major obstacle to improved relations between individuals, groups, peoples, nations.

The paths of understanding cannot be traced by economic, legal, social, and cultural circuits alone; we also need intellectual and ethical circuits to develop dual intellectual and human understanding.

3. ETHICS OF UNDERSTANDING

The ethics of understanding is a refinement that begins with disinterested understanding. This demands great effort, because there can be no hope of reciprocity: the person threatened with death by a fanatic understands why the fanatic wants to kill him, and knows that the fanatic will never understand him. Understanding that the fanatic cannot understand us means understanding the roots, forms, and manifestations of fanaticism. It is understanding why and how a person feels hatred or contempt.

The ethics of understanding demands that we discuss and refute instead of damning and excommunicating. Confining in the notion of treachery something that pertains to a broader intelligibility is a refusal to recognize error, misdirection, ideology, excess.

Understanding neither excuses nor accuses. It teaches us to refrain from condemning hastily, irremediably, as if we ourselves had never erred. *If we learn to understand before condemning, we will be on the way to humanizing human relations.*

How is understanding encouraged?

3.1 "Thorough thinking"

This is a way of thinking that can grasp text and context, individual and environment, local and global, the multidimensional, in a word, the complex: the conditions of human behavior. And this "thorough thinking" helps us understand the objective and subjective conditions of behavior (self-deception, possession by faith, delirium, hysteria).

3.2 Introspection

The mental practice of continuous self-examination is necessary because when we understand our own weaknesses and failings we can understand the weaknesses and failings of others. If we realize that we are all fallible, fragile, inadequate, deficient, then we can realize that we all share this need for understanding.

Critical self-examination helps us decenter ourselves enough to recognize and judge our own egocentrism. Then we don't set ourselves up as judges of all things.¹⁴

4. AWARENESS OF HUMAN COMPLEXITY

Understanding others demands awareness of human complexity.

We can learn from literature and cinema that a human being should not be reduced to the least part of himself or the worst part of his past. In real life someone who has committed a crime is quickly confined in the notion of criminal, reducing all other aspects of his life and person to this single feature, but we discover the gangster kings of Shakespeare and the royal gangsters of *films noirs* in all their fullness. We can see how literary criminals like Jean Valjean and Raskolnikov transform and redeem themselves.

In art we can finally learn the greatest lessons of life: compassion and true understanding for the humiliated in their suffering.

4.1 Subjective (sympathetic) open-heartedness to others

We are open to certain special closely related people but usually closed to others. Psychological techniques of projection and identification in films draw on the fullness of our subjectivity, bringing us to understand and sympathize with people who in ordinary circumstances would be foreign or revolting. Someone who is disgusted by a tramp he sees in the street will open his heart to the movie tramp, Charlie Chaplin. Spiritual and physical suffering that leaves us indifferent in daily life inspires compassion and commiseration in films and novels.

¹⁴ Two common insults—"c'est un con [he's a dumb-ass]" and "c'est un salaud [he's a lousy bastard]"—express total incomprehension and absolute pretension to moral and intellectual sovereignty.

4.2 Tolerance interiorized

True tolerance is not generalized skepticism or indifference to ideas. Tolerance implies that we have convictions and faith, make ethical choices and at the same time accept the rights of others to express different or even opposite choices, convictions, and ideas. Tolerance implies that we do indeed suffer from the expression of ideas which we find negative or harmful, but we choose to accept this suffering.

There are four degrees of tolerance. The first, as formulated by Voltaire, makes us respect the right of another to express things that we find vile, not because we respect what is vile but because we refrain from silencing him by imposing our notion of vileness. The second degree of tolerance is inseparable from the democratic option: the encouragement of diverse, antagonistic opinions is proper to democracy; the democratic principle enjoins each individual to respect the expression of ideas antagonistic to his own. The third degree of tolerance follows from Niels Bohr's notion that the opposite of a profound idea is another profound idea, meaning there is truth in ideas antagonistic to our own, and this is the truth that must be respected. The fourth degree of tolerance comes from awareness that people can be possessed by myths, ideologies, ideas, or gods, and can be carried away in directions they hadn't intended to take.

Tolerance is valid for ideas. Not for insults, attacks, murderous acts.

5. PLANETARY UNDERSTANDING, ETHICS AND CULTURE

We should connect ethics of inter-personal understanding with the greater need for globalized understanding in planetary era ethics. The only globalization that would really serve mankind is globalized understanding, globalized spiritual and intellectual human solidarity.

Cultures should learn from each other; the haughty West that prides itself as a teaching culture should also become a learning culture. Understanding is also constantly learning and re-learning.

How can cultures communicate? Magoroh Maruyama offers a useful suggestion.¹⁵ The dominant mentalities in every culture are ethno- or sociocentric, that is, rather closed with regard to other cultures. But every culture also harbors open, inquisitive, unorthodox, deviant mentalities, as well as people born of mixed marriages who are natural inter-cultural bridges. The deviants are often writers or poets whose words spread in their own country and far beyond.

Cultural globalization related to art, music, literature, and thought does not homogenize. It advances in the form of great transnational waves that carry the expression of national originalities. This is how culture flourished in Europe in the Classic, Enlightenment, Romantic, Realist and Surrealist periods. Today, African, South American, and Japanese novels are published in major European languages and European novels are published in the Far East, the Orient, Africa, and the Americas. Translations of novels, essays, and philosophical works give people in

¹⁵ "Mindscapes, individuals, and cultures in management," *Journal of Management inquiry*: v.2-n° 2: 138-54, June 1993. Sage Publication.

every land access to the works of other lands, and give them a chance to nurture themselves with cultures of the world while nurturing with their own creations a planetary cultural banquet. Of course this rich banquet of varied original contributions from multiple cultures suits the appetite of a small minority in every nation, but its development is a significant feature of the latter half of the 20th century and should intensify in the 21st, to the advantage of mutual human understanding.

Oriental cultures stimulate varied curiosities and questioning in the Occident. Translations of the *Aveta* and the *Upanishads* were available in the West in the 18th century, Confucius and Lao Tseu in the 19th, but these Asian writings were primarily subjects for scholars until the 20th century, when African arts, Islamic philosophies and mystics, sacred Indian texts, Taoist and Buddhist thought became vital sources for the Western soul hustled and shackled in activism, productivism, efficiency, entertainment, and aspiring to inner peace and a harmonious relation with the body.

To some minds this opening of Western culture is uncomprehending and incomprehensible. But the open self-critical rationality of European culture leaves room for understanding and integration of elements that have atrophied in our culture and flourished in others. The West also has to integrate virtues of other cultures in order to correct the activism, pragmatism, quantitativism, frenetic consumationism it has unleashed at home and abroad. But it should also safeguard, regenerate and propagate the best of its own culture which produced democracy, human rights, protection of the citizen's private life.

Understanding between societies implies open democratic societies, which means that the path to Understanding between cultures, peoples, and nations implies a generalization of open democratic societies.

But we must not forget that the epistemological problem of understanding subsist, even in open democratic societies. Understanding across different thought structures requires the ability to pass through a meta-thought structure that can understand the causes of incomprehension from one to another, and overcome it.

Understanding is both the means and end of human communication. Our planet needs mutual understanding in all directions. Given the importance of education for understanding, on all educational levels and for all ages, the development of understanding demands a planetary reform of mentalities: this is a task for education of the future.

CHAPTER VII

ETHICS FOR THE HUMAN GENRE

As we saw in chapter III, the complex concept of the human genre is composed of the *individual* ↔ *society* ↔ *species* triad. Individuals are more than simple products of the reproductive process of the human species, but this process is produced by individuals in every generation. Interactions between individuals produce society and society retroacts on individuals. Culture in the generic sense emerges from these interactions, connects them, and gives them value. *Individual* ↔ *society* ↔ *species* maintain each other in the full force of the word: they sustain, nourish, and connect each other.

So, *individual* ↔ *society* ↔ *species* are not only inseparable, they are coproducers of each other. Each term is both the means and the ends of the other terms. No term can be absolutized and no term can be raised to the supreme finality of the triad: the triad itself is rotationally its own finality. Consequently these elements cannot be understood as dissociated: every concept of the human genre means joint development of individual autonomies, community participation, and the feeling of belonging to the human species. The conscience arises in the heart of this complex triad.

A properly human ethics, that is, anthropo-ethics should be considered as an ethics of the three-term *individual* ↔ *society* ↔ *species* loop, in which our truly human mind and conscience arise. This is the basis for teaching the ethics of the future.

Anthropo-ethics implies an enlightened, conscious decision:

- ◆ To take responsibility for our *individual* ↔ *society* ↔ *species* human condition in the complexity of our being.
- ◆ To accomplish humanity within ourselves in our personal conscience.
- ◆ To take responsibility for the future of humanity with its antinomies and its abundance.

Anthropo-ethics demands that we take responsibility for the anthropological mission of the millennium, by:

- Striving to humanize humanity.
- Taking in hand the double piloting of the planet: follow life, guide life.
- Accomplishing planetary unity in diversity.
- Respecting in others both difference from and sameness with oneself.
- Developing an ethics of solidarity.
- Developing an ethics of understanding.
- Teaching ethics for the human genre.

Anthropo-ethics includes hope in the fulfillment of humanity as planetary conscience and citizenship. So, like all ethics, it includes aspiration and determination and, in addition, a wager within uncertainty. Anthropo-ethics is individual conscience beyond individuality.

1. THE INDIVIDUAL ↔ SOCIETY LOOP: TEACHING DEMOCRACY

Individual and Society exist mutually. Democracy permits the rich, complex *individual ↔ society* relation, where individuals and society can fulfill, regulate, control, and assist each other.

Because democracy is based on control of the power apparatus by those it controls, it reduces servitude (determined by powers that are not subject to retroaction from those it subjugates). In this sense democracy is more than a political regime, it is the continuous regeneration of a complex retroacting loop: citizens produce the democracy that produces citizens.

Unlike democratic societies, which function on the base of individual freedom and responsabilization, authoritarian and totalitarian societies reduce individuals to colonized subjects. In democracy the individual is a citizen, a responsible person with legal status; he enjoys freedom to express his wishes and interests, he accepts responsibility as a member of the body politic.

1.1 Democracy and complexity

There is no simple definition of democracy. The sovereignty of the people as citizens includes self-limitation of this sovereignty by obedience to laws and transfer of sovereignty to elected officials. And democracy includes self-limitation of State domination by separation of powers, guarantee of individual rights, and protection of private life.

Obviously democracy demands the consensus of the majority of citizens and respect for democratic rules. The great majority of citizens must believe in democracy. But democracy also needs diversity and antagonism.

The experience of totalitarianism has highlighted a key feature of democracy—its vital link with diversity.

Democracy expects and nurtures diversity of interests and diversity of ideas. Respect for diversity means that democracy cannot be confused with dictatorship of the majority over minorities; it must include the rights of minorities and protesters to exist and express themselves; it must allow the expression of heretical and deviant ideas. Just as the diversity of species must be protected to safeguard the biosphere, so the diversity of ideas, opinions, information sources and media must be protected to safeguard democratic life.

Democracy needs conflict of ideas and opinions; they are a source of vitality and productivity. But conflict does not stimulate vitality and productivity unless it operates with respect for democratic rules that regulate antagonism, replace physical battles with battles of ideas and, by debate and voting, elect the provisional winner in a running conflict of ideas; the victor, in exchange, must give an accounting of the application of his ideas. With its demand for consensus, diversity, and conflict, democracy is a complex system of political organization and civilization that nurtures and feeds on the autonomy of individual minds, their freedom of opinion and expression, and their civic spirit that nurtures and feeds on the ideal *Liberty ↔ Equality ↔ Fraternity*, that includes creative conflict between the three inseparable terms.

Democracy forms a complex political system because it thrives on plurality, competition, and antagonism while remaining a united community.

Democracy is the union of union and disunion: it tolerate and feeds endemically, sometimes eruptively, on conflicts that are the source of its vitality. It lives on plurality all the way up to the summit of the State (separation of executive, legislative, and judicial powers) and must maintain this plurality to maintain itself.

The development of political, economic, and social complexities nurtures the development of individuality, and this is affirmed in the rights (of man and the citizen) that grant existential individual freedoms (free choice of life partner, residence, leisure activities...).

1.2 The democratic dialogic

All the important features of democracy have a dialogic quality that unites antagonistic terms in a complementary way: *consensus / conflict, liberty ↔ equality ↔ fraternity, national community / social and ideological antagonisms*. And democracy depends on conditions that depend on its practice (civic spirit, acceptance of the democratic rules of the game).

Democracies are fragile: they thrive on conflict but can also be submerged by it. Democracy is not yet generalized over our planet still rife with dictatorships and residues of 20th century totalitarianism, still fertile with the seeds of new totalitarianisms. These dangers will persist in the 21st century. Moreover, existent democracies are not fully accomplished; they are incomplete or unfinished. The democratization of Western societies was a long process, slow to take hold in certain areas such as equal rights between men and women in the family, work, and public careers. Western socialism has not been able to democratize the economic/social organization of business enterprises. Corporate society is still an authoritarian, hierarchical system, very partially democratized at the base by councils or unions. It is undeniable that there are limits to democratization in organizations like the military, where effectiveness is based on obedience. But it is fair to ask, as some companies have done, if there isn't a different kind of efficiency that can be achieved by appealing to individual or group initiative and responsibility. Whatever way we look at the question, we must recognize that our democracies are incomplete and deficient. For example, concerned citizens have not been consulted on alternative solutions in transportation (TGV, jumbo jets, super highways, etc.).

And it is not just a problem of unfinished democratic business; there is a process of democratic regression that tends to dispossess citizens of major political decisions (under the pretext that only technocratic "specialists" are competent to make such "complicated" decisions) atrophy their competence, endanger diversity, degrade civic spirit.

These regressive processes are related to the growing complexity of problems and the mutilating way of handling them. Politics is fragmented into different spheres and the possibility of conceiving them together dwindles or disappears.

At the same time politics is depoliticized, dissolved in administration, technique (expertise), economy, quantifying thought

(polls, statistics.) Piecemeal politics loses the means to understand life, suffering, distress, solitude, non-quantifiable needs. All of this contributes to a tremendous democratic regression where the citizens are dispossessed of the fundamental problems of the city.

1.3 The future of democracy

21st century democracies will be faced with a huge problem that arises from the development of the enormous machine where science, technology, and bureaucracy are intimately associated. This enormous machine does produce knowledge and elucidation, but it also produces ignorance and blindness. The progress of disciplinary science has offered the advantages of division of labor and the inconveniences of over specialization, partitioning and fragmentation of knowledge. Learning becomes more esoteric (available only to specialists) and anonymous (concentrated in data banks, used by anonymous authorities, first and foremost the State). Technical knowledge is reserved for experts who are competent in their closed field and incompetent when that field is parasitized by outside influences or modified by new events. In these conditions the citizen loses the right to knowledge. He has a right to acquire specialized knowledge through ad hoc studies but is dispossessed as citizen from a comprehensive pertinent viewpoint. Atomic weapons, for example, have totally dispossessed the citizen of the possibility of reflecting on them and controlling them. The use of this ultimate weapon is generally reserved as a personal decision of the head of State, acting alone, without consulting any regular democratic authority. The more politics becomes technical the more democratic competence backslides.

The problem does not only apply to crisis or war, it affects everyday life as well. The growth of the technobureaucracy institutes the reign of experts; no longer dependent on political discussion and decisions, the technobureaucracy usurps the citizen's role in critical fields open to biological manipulation of paternity, maternity, birth and death. With rare exceptions these problems were excluded from political conscience and democratic debate in the 20th century.

On a more profound level the widening chasm between citizens and hyperspecialized esoteric technoscience leads to a duality between people who know—whose piecemeal knowledge cannot contextualize and globalize—and people who are ignorant, that is the citizens as a whole. The same process is underway between rich and poor countries with regard to access to new communications technology.

Citizens are pushed out of political spheres which are increasingly monopolized by "experts," and the domination of the "new class" is an obstacle to democratization of knowledge.

In this situation, when politics is reduced to technology and economics, and economics is reduced to growth, references and horizons disappear, the civic spirit is weakened, people find escape and refuge in private life, society alternates periods of apathy and violent rebellion and, despite the pursuit of democratic institutions, democratic life wastes away.

In these conditions, reputedly democratic societies are faced with the task of regenerating democracy while a large part of the world is still faced with the question of how to build democracy, and planetary

necessities call for the creation of a new democratic possibility on their scale.

Democratic regeneration implies the regeneration of civic spirit, the regeneration of civic spirit implies the regeneration of solidarity and responsibility, meaning the development of anthropo-ethics.¹⁶

2. TEACHING EARTH CITIZENSHIP: THE INDIVIDUAL ↔ SPECIES LOOP

The ethical bond of the individual to the human species was already affirmed in antique civilizations. A character in *Bourreau de soi-même* by the second century BC Latin author, Terrence, says, "*homo sum, nihil a me alienum puto* (I am human, nothing that is human is foreign to me)."

This anthropo-ethics which has been masked, obscured, and whittled away by various closed cultural ethics has been consistently upheld in the great universalistic religions and repeatedly re-emerges in universalistic ethics, humanism, the rights of man, the Kantian imperative.

Kant already observed that the geographical finitude of our earth imposes on its inhabitants a principle of universal hospitality that recognizes the right of the Other to not be treated as an enemy. In the 20th century, the community fate of the earth imposed solidarity as a vital necessity.

3. HUMANITY AS A PLANETARY FATE

In our community of planetary fate we can take responsibility for the fulfillment of that part of anthropo-ethics involving the relation between the singular individual and the human species as a whole.

The community should strive to develop the human species, which remains the *biologico-reproductive* instance of the human, and with the help of individuals and societies finally concretely give birth to Humanity as common conscience and planetary solidarity of the human genre.

Humanity is no longer simply a biological notion but it should be fully recognized in its inseparable inclusion in the biosphere. Humanity is no longer a notion without roots, it is rooted in a "Homeland," the Earth, and the *Earth is an endangered Homeland*. Humanity is no longer an abstract notion, it is a vital reality because now, for the first time, it is threatened with death. Humanity is no longer just an ideal notion, it has become a community of fate and only the conscience of that community can lead it to a community of life. Humanity has become a supremely

¹⁶ One might ask if schools could not be practically and concretely laboratories of democratic life. Of course this would be limited democracy, because a teacher cannot be elected by his students, and the necessary collective self-discipline cannot fully replace imposed discipline, and also because the inequality of principle between those who know and those who learn cannot be abolished. Nevertheless (and because the autonomy acquired by adolescents demands it) authority cannot be unconditional, and rules could be established for questioning decisions considered arbitrary, notably with the institution of a student-elected class council or even outside arbitrators. The reform of French lycées undertaken in 1999 provides for such a mechanism. Above all, the classroom should be a place where students learn the rules of debate and fair discussion, awareness of necessities and procedures of understanding the other's thinking, hearing out and respecting minority and deviant voices. Learning to understand others should be a major element in democratic apprenticeship.

ethical notion: it is what must be accomplished by and in each and every one.

While the human species pursues its adventure under the menace of self-destruction, the imperative has become to save Humanity by realizing it.

Domination, oppression, and human barbarities undeniably persist and aggravate on our planet. These are fundamental anthropo-historical problems with no a priori solution; but they are subject to improvement, and can only be treated by the multidimensional process that will strive to civilize all of us, our societies, the earth.

Each separately and all together, a politics of man¹⁷, a politics of civilization,¹⁸ a reform of thought, anthropo-ethics, genuine humanism, awareness of our *Earth-Homeland* will reduce ignominy in this world.

Individual fulfillment and free expression will long remain (cf., Chapter III) our ethical and political designs for the planet: this implies development of the *individual* ⇔ *society* relationship in the direction of democracy, and development of the *individual* ⇔ *species* relation in the direction of the realization of Humanity, meaning that the individual remains integrated into the mutual development of the terms of the *individual* ⇔ *society* ⇔ *species* triad. We do not have the keys to a better future. Our route is not traced out. "*El camino se hace al andar*," (Antonio Machado)¹⁹. But we can define our finalities: the pursuit of hominization in humanization via accession to earth citizenship...for an organized planetary community.

Is this not the true mission of the *United Nations Organization*?

¹⁷ Cf., Morin, Edgar. *Introduction à une politique de l'homme*. New edition, Points Seuil, 1999.

¹⁸ Cf., Morin, Edgar & Nair, Sami. *Politique de civilisation*. Arlea, 1997.

¹⁹ "We trace our path as we go."

"OPEN" BIBLIOGRAPHY

The intentional absence of a bibliography is related to the nature of this work of suggestion and reflection. The scope of the text refers to an extensive bibliography which goes far beyond the dimensions of the present publication. I did not wish to impose a short selected bibliography. Interested readers will reach their own judgments through their own selected readings. Pertinent works are available within each culture and language, inherent to these cultures; it would not be my intention to enumerate and exclude in thinking that I am selecting.