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**NEW HORIZONS
IN MUSIC**



FRESCOS RISING FROM THE SANDS

Archaeological excavations carried out in Sudanese and Egyptian Nubia during the past two years have yielded spectacular discoveries of the greatest historical and artistic importance. Over twenty countries have thus far sent expeditions into this area which will soon be flooded by the waters of the Nile. Here frescoes from a buried Christian church, unearthed by Polish archaeologists, are seen as they emerge from the sand for the first time in almost a thousand years. (Story page 18)

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**PUBLISHED IN
EIGHT EDITIONS**

English
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Spanish
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German
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COVER PHOTO

This strange contraption is one of a number of new musical instruments invented by two young Frenchmen in recent years. The instruments create sounds impossible to achieve on ordinary musical instruments and exemplify present efforts to explore new horizons in the world of music. (See page 12.)

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SOCIETY CALLS THE TUNE

by Peter Lengyel

ALL art reflects the complexity of the society which produces it. Music, perhaps the most spontaneous of the arts, is no exception and we shall examine here how musical taste and production are related to social structure. Can one learn anything about a culture by listening to its music? I believe that one certainly can, and that the reverse also holds true: one needs to know something about a culture before really appreciating its music.

The history of music goes back to the various folk idioms, which are the collective and mainly anonymous characteristics of certain cultures, or of stages in their evolution. Their origins are not commonly known with any precision, though the effects of certain recorded events can often be clearly distinguished.

Thus typical elements of North African origin in Spanish folk music are a relic of the Moorish occupation of Spain, just as the diffusion of certain modes and phrasings of Mediterranean origin to other parts of Europe bear witness to the passage of the troubadours and trouvères, those wandering minstrels of the Middle Ages who,

fanning out from Provence, came to be greatly admired for their accomplishment in distant parts.

Folk music is essentially traditional and mostly unwritten (except when collected and noted by scholars): like the great Gothic cathedrals or the ancient sagas and myths, it is the result of an accumulation of artistic effort, most of the individual contributions to which are hard to distinguish from each other. No doubt there were important musical innovators who exercised an incisive influence in their day, but their names are lost and it is probable that they were not particularly honoured in their lifetime, for the folk audience did not take a sophisticated interest in art for art's sake.

On the contrary, folk pieces tend to be short and specific to common situations: they might be dances, ballads, songs for festive or special occasions (banquets, lullabies, work songs, dirges), hunting calls or military marches. Also, they are generally intended for performance by the voice or on selected and usually simple instruments, widely available and none too difficult to play.

Melody and rhythm, rather than harmony and timbre, are their outstanding features: "abstract" music, long compositions in complex form and music which calls for considerable technical equipment (whether in the shape of instruments or performing skills) has little or no place in folk music.

Folk musicians rarely had the benefit of formal musical

4 PETER LENGYEL is in charge of projects on economic and social development in the Department of Social Sciences of UNESCO. For many years he has studied the shifting place of music in social life through the ages in Europe.

Left, concert in an 18th century drawing room. Right, jazz drummer Lionel Hampton in action. Jazz, a music in which improvisation plays a major role, has been called a new folk idiom, reflecting as it does many aspects of our time and appealing to the most diverse audiences. The abstract and "learned" classical music of two centuries ago was written for the pleasure and appreciation of a cultured minority audience.



© Jean-Pierre Leloir

training other than that which might be handed down from father to son, nor were they acquainted with a repertory beyond the traditional one. These limitations gave them a simplicity and constancy which their less naive successors could not validly claim. Thus the folk musician strove to encompass the entire gamut of his listener's emotional experience in the only terms available to him. If many cultures never really moved beyond the folk stage in their musical expression, this is an index of their continued homogeneity, separateness and cohesion. Undisturbed in patterns of living and basic values, they reflected such simplicity in their art.

In Europe, as in several other parts of the world, notably in Asia, however, increasing social differentiation brought with it the rise of "learned" or "classical" music. This was distinguished from folk music by being addressed to minority audiences, giving expression to increasingly singular emotions or abstract sentiments and being the product of composers schooled in certain established conventions and techniques. Also, classical music is mostly written, leaving a decreasing amount of latitude to the performer's fancy and introducing a formal distinction between the creative artist (the composer) and the executing artist (the player or singer), which is rare in folk music.

The rise of classical music owed a great deal to the patronage of churches and courts, both of which used it to enhance their prestige and as a commonly acceptable

vehicle to convey uncommon concepts. In Europe, the earliest school of classical composers were the Polyphonists, who flourished from the 10th to the 17th centuries and whose art, as the name suggests, lay in the combination of several voices singing different but superimposed melodic lines simultaneously.

Since they were chiefly in the service of the church, the works of prominent Polyphonists, such as Byrd in England, Orlandus Lassus and Josquin dès Près in Flanders, Victoria in Spain and Palestrina in Italy, were typically couched in the form of masses, anthems and motets. Their most important output for profane use were the madrigals, written for amateur domestic performance, of which large collections by various masters are known to us today.

From the combination of several voices singing different parts, the logical development was to have these parts performed by instruments, or by voices and instruments together. It is to this art that the succeeding school of European classical composers—the Contrapuntalists—devoted itself. By this time (the second half of the 17th and the 18th century), two other important developments were also taking place.

Firstly, great strides were being made in perfecting instruments through inventions (keyboard instruments), refinements (string instruments) and technical improve-

Orchestras for kings, dukes and generals

ments (wind instruments) which not only allowed for hitherto unknown flights of virtuosity in performance but also encouraged the exploration of novel timbres and effects through orchestration.

Secondly, increasing attention was paid to the formal aspect of music as the "learned" tradition took hold: simple two-section (binary) or three-section (tertiary) pieces were supplemented by compositions cast in the more complicated form of fugues or airs with variations.

Such evolution, in turn, reflected the increasing complexity of European society and the widening of audiences and sources of patronage. While the Polyphonists relied chiefly on the church for support, and to a lesser extent on the courts and on educated amateurs, the Contrapuntalists already had wider profane outlets including increasingly wealthy aristocratic circles and the rising middle classes.

Johann Sebastian Bach successively held posts as a choirboy, violinist in a princely band, town organist, chief court musician and cantor of the municipal school of Leipzig. George Frederick Händel speculated in public entertainment with his operas and made a career in Germany, Italy and England.

Most of the Contrapuntalists tried their hand at many kinds of music—choral, instrumental, orchestral, stage, military, ceremonial, sacred—frequently in response to commissions. They were artisans who responded to new demands: in the widening field open to them, they became acknowledged masters of a versatile trade with enlarged horizons for themselves and for their art.

UP to this stage, the folk and "learned" traditions of music in Europe tended to diverge. Learned composers became men of the world who mixed with the upper classes, had access to kings, dukes, popes and generals, and formed as well as shared their tastes. Folk musicians remained obscure, playing to the common people in what came to be regarded as a crude and rustic manner; they did not have great orchestras or choirs at their disposal, nor were they challenged by the theatre, the pomp of state and religion and the demands of talented amateurs. Their idiom was unsuited to the expression of lofty abstractions, like charity and humility, patriotism and loyalty, and they could not compete with their grand colleagues. This state of affairs carried over into the next important period of European musical history, the Classical epoch.

It is true that Haydn introduced German, Hungarian and Slav folk melodies into his music, sometimes for light relief, sometimes with deliberate expressive purpose, while Beethoven gave full symphonic treatment to peasant dances and Schubert derived the *lied* (or art song) from traditional German patterns. Yet these were but episodes, paralleled by attempts to present popular music to sophisticated audiences, such as the ballad operas of the 18th century, amongst which the *Beggar's Opera* by Gay and Pepusch achieved enduring fame.

6 It was the Romantics of the 19th century who, after an excess of courtly and ecclesiastical discipline, suddenly discovered the as yet untapped sources of folk music which lay all around them and provided material as rich

and diverse as it was colourfully attractive to mixed audiences removed from the traditional life.

"Nationalistic" composers, working the vein of folk music and incorporating it into their personal styles, flourished everywhere: Mussorgsky, Borodin, Tchaikowsky and Rimsky-Korsakov in Russia, Smetana and Dvorak in Bohemia, Chopin in Poland, Liszt, and later Bartok and Kodaly in Hungary, Grieg in Norway, de Falla, Granados and Albeniz in Spain, Vaughan-Williams in Britain, and more recently, Enesco in Rumania, Villa-Lobos in Brazil, Copeland and Gershwin in the U. S.

THERE was even a considerable amount of fascination with the folk music of foreign countries. Bizet's *Carmen*, undoubtedly the most popular opera ever written in the Spanish idiom, is the work of one Frenchman, based on a story by a second which, in turn, was adapted as a libretto by two others. Tchaikowsky wrote several pieces incorporating popular Italian airs, as did Mendelssohn, who also used Scottish tunes. Brahms' Hungarian dances are famous; so are Dvorak's *New World* symphony and his American quartet, incorporating Negro themes.

There now occurred a period of convergent development. While folk music was being studied, recorded and worked up by "learned" composers, classical music was also to some extent passing into the popular domain. The operetta is a typical example of musical entertainment which, while cast in a version of the "learned" idiom, appeals to the taste of a public that is not necessarily sophisticated in its musical tastes.

Those who flocked to applaud Offenbach's excellent comedies, or the endlessly tuneful light operas of Johann Strauss might not have been able to tell Berlioz from Rossini, nor cared to do so. But they were equally strangers to pure folk music being, for the most part, city dwellers and members of an industrializing, specializing society, increasingly cosmopolitan, increasingly eclectic, decreasingly linked to their own traditional sectors.

WITHOUT being particularly conscious of the process, the pace-setting elites and their crowds of imitators, had gradually been made familiar not only with elaborations of their home folk materials, but also with exotic elements originating, perhaps, from Africa, the Far East or Polynesia. The process was, incidentally, two-way, for it also acquainted audiences in Tokyo, Cairo or Rio de Janeiro with the musical fashions of Paris, Vienna and Milan.

At the same time, however, true folk music itself began to decline, for it was assailed with increasing strength by an international idiom (the amalgam of several folk traditions, plus an infusion of "learned" styles) which caught the imagination of millions all over the world. Thus, some of the lieder of Schubert, arias by Mozart, Verdi and Puccini, a few instrumental or orchestral pieces as well as a host of airs and dances, from "John Brown's Body" to



© Paris-Match

PHILOSOPHY OF MUSIC. Today, musicians as well as sociologists are preoccupied with the meaning of music and its future. Above, Olivier Messiaen, the eminent French composer surrounded by his pupils at the Paris Conservatoire Nationale de Musique, where he lectures on the philosophy of music.

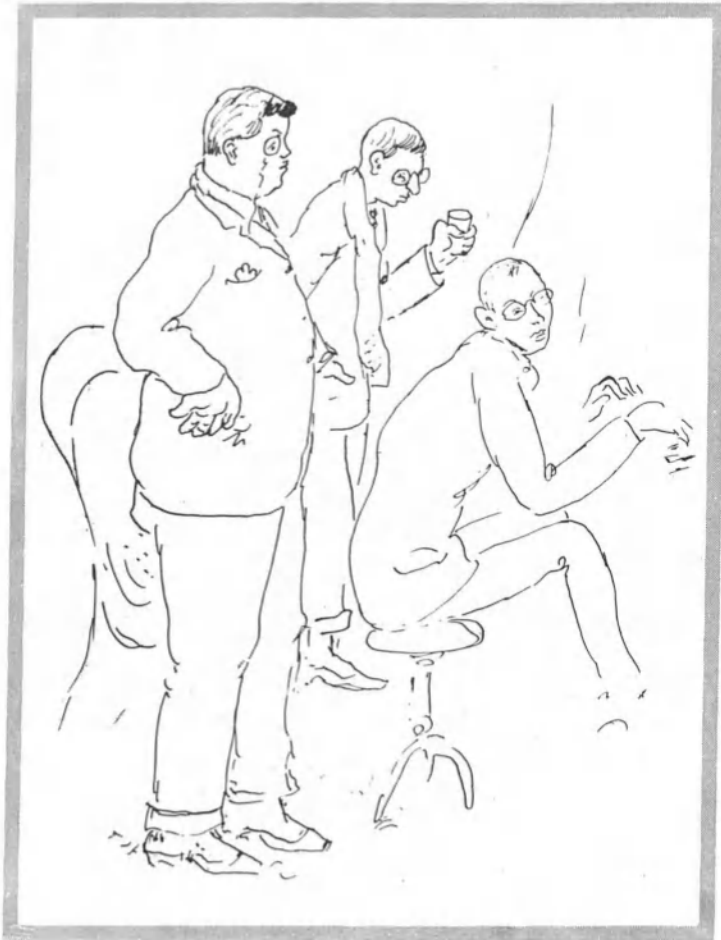
STEEPED IN FOLK TRADITIONS. The Romantics of the 19th century suddenly discovered the untapped sources of folk music. Composers in many lands have since worked this vein and incorporated it into their personal styles. One example is George Gershwin's opera, "Porgy and Bess" (recently brought to the screen, and a scene from which is shown below) whose music is steeped in American Negro folk traditions.

Samuel Goldwyn Productions-Columbia



MUSIC SKETCH BOOK

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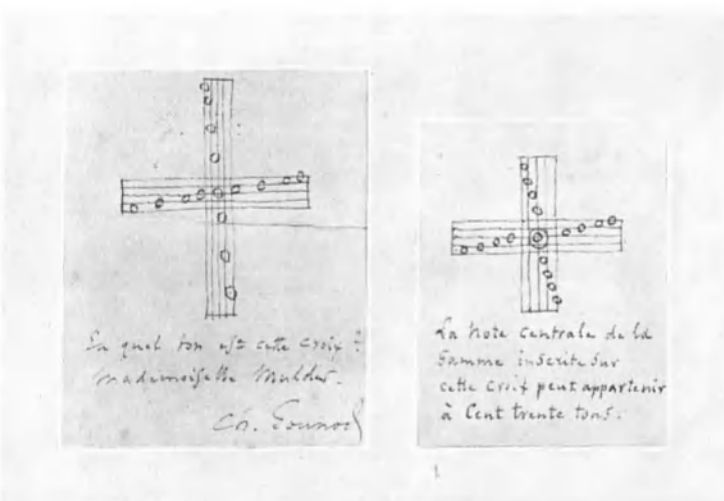


Drawing, above, by Russian artist Larionov shows Serge Prokofiev, at the piano with composer-conductor Igor Stravinsky, (glass in hand) and Serge Diaghilev, founder of the famous Ballets Russes.

Niccolo Paganini (right) composer and one of the world's greatest virtuosos of the violin.



Enrico Caruso (left). Self-portrait by the great Italian tenor who was also a skilled caricaturist.



8 Musical puzzle invented by Charles Gounod which shows that in a given scale arrangement the same note is found in 130 different tones.



Arturo Toscanini (Italy)



Bela Bartok (Hungary)



Leonard Bernstein (U.S.A.)

CELEBRITIES DRAWN BY AN ARTIST-MUSICIAN

Musician and artist, B. F. Dolbin is an American of Austrian birth now living in New York, who is well-known in America for his drawings and caricatures of celebrated musicians and composers such as the six reproduced here. He has also done hundreds of portraits of great modern figures in the theatre, art, and science.



Dimitri Shostakovich (U.S.S.R.)



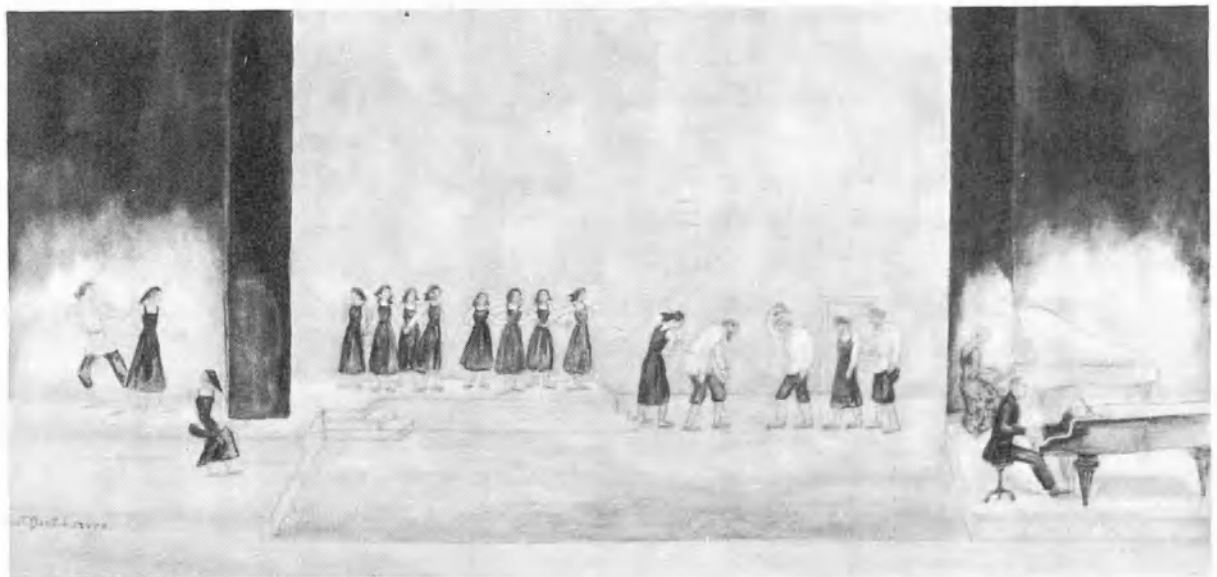
Arnold Schoenberg (Austria)



Hector Villa-Lobos (Brazil)

STRAVINSKY BALLET SET

Scene from "Les Noces" one of the ballets written for Diaghilev's Ballet Russe company by Igor Stravinsky. Its premiere was given in Paris in 1923 when this drawing was made by Nathalie Gontcharova, who was responsible for the setting, the curtain and costumes.



The many faces of modern jazz

"Auprès de ma blonde," from the tarantella to the tango, passed into the international cultural patrimony.

Folk music, in the old-fashioned sense of the term, flourishes, if at all, only in regions still shielded from the mainstream of modern life, though mixed forms of it naturally continue to evolve everywhere, and with specially creative vigour in countries with mixed populations, such as Brazil or Israel.

Yet the victory of any single "learned" or semi-learned idiom of music is far from complete. For with the emergence of an international audience, there also arose an industry which sought to cater to as wide a consensus of its tastes as possible. It is often argued that the products of this industry—"pop" songs, dance music, film music, etc.—are hopelessly debauching contemporary musical standards by throwing out immense quantities of a commercial product hastily stitched together from worn and disparate patches.

A captive public, exposed to such music wherever it goes—at the factory, in airports, over television, in restaurants, at parties, in cars—is having its aesthetic responses blunted by a sort of journalese of sound which panders to fashionable fads and exploits the most banal, superficial and conventional reactions of the listener, deliberately avoiding anything that might conceivably displease at first hearing.

The situation today strikes many critics as one where people face only the choice between the remote, in-

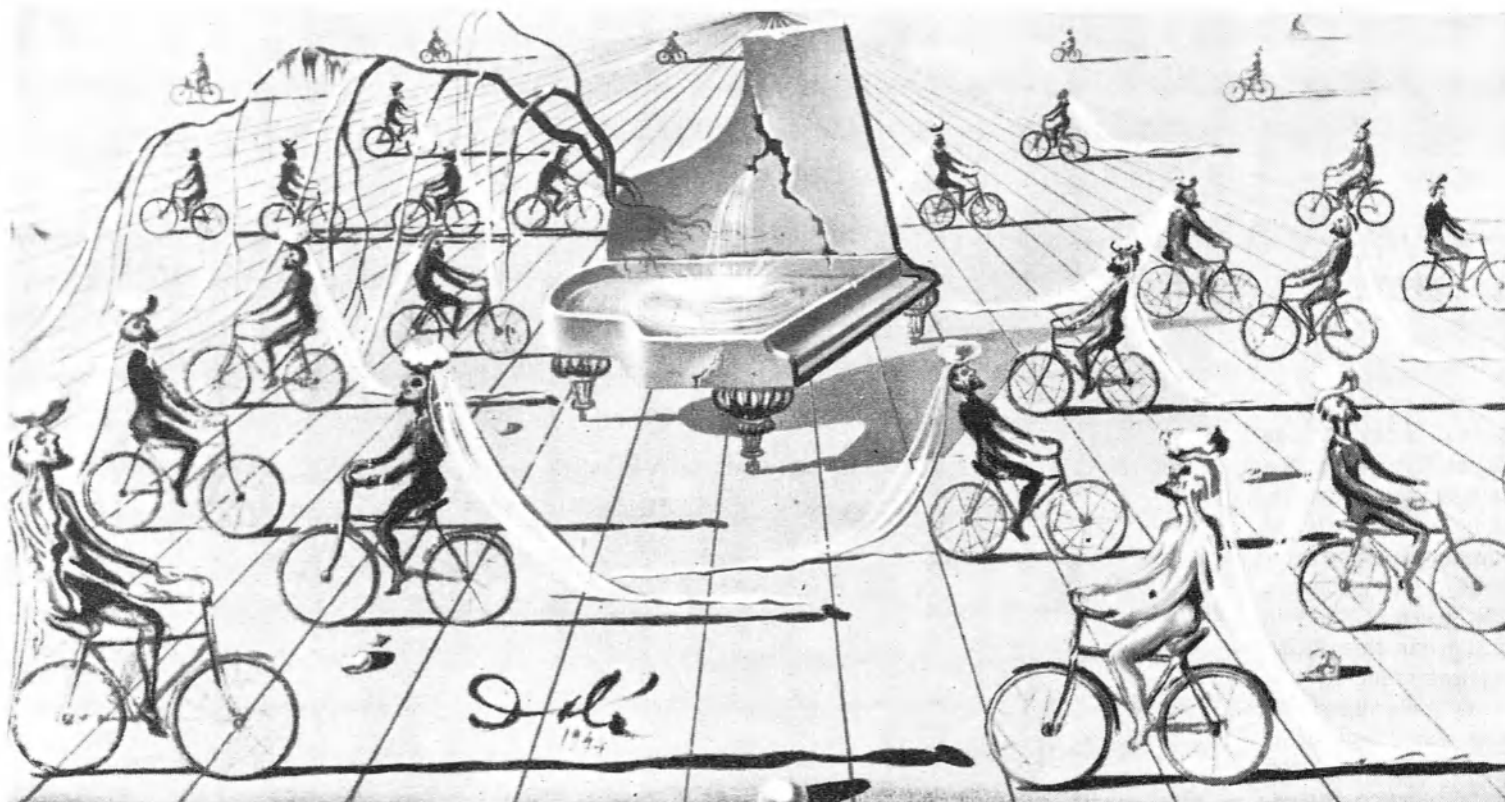


J. Gorne, Paris

MUSIC EVERYWHERE. Wherever they go today people have access to music. Music is brought to them constantly by radio, TV, records and loudspeaker systems. "Pop" songs blare out from juke boxes like this one (right) in a Parisian cafe with its teen-age audience. To feed juke boxes, gramophones in the home and disk jockeys on the radio, millions and millions of records are being produced. Above, a gramophone factory worker separates recording plate from matrix with which records will be mass-produced.

tellecualized and difficult work of serious composers and the half-baked, half-heard leftovers which constitute the background to daily activities. One consequence of what has been called "the appalling popularity of music" is to make the effort at communicating something that is at once artistically valid and widely accessible an increasingly delicate task.

BALLET DECOR BY DALI. Ballet with its themes of drama, fairy-tale, fable and life has offered a rich medium for musical expression. Since the time of Lully, the 17th century French composer, often considered as the first to make an art of ballet music composition, many great musicians have combined their efforts with those of choreographers and artists to produce spectacles enchanting equally to eye and ear. Below, a Salvador Dali painting for a backdrop used in a modernistic ballet "Sentimental Colloquy", first produced in New York in 1944 by the Ballet International Company, with music by Paul Bowles and choreography by André Eglevsky.



From "Art in Modern Ballet" by George Auer, Pantheon Books Inc., New York



© Alamy-Vauthey

There is also the opinion which asserts that an entirely new folk idiom has recently arisen, one that is a characteristic of our age, and as good an expression of its quality, as the folk music of earlier, more circumscribed and simpler cultures. This is jazz. Born of a cross-current of influences—Spanish, French, African, English, Creole, Protestant hymns, military marches—in a country which is itself a melting-pot of cultures, jazz certainly transcends frontiers with amazing ease, and seems to mirror current moods in the most distant places.

Its element of improvisation has about it something of the tentative, episodic and rapid features of modern life. Then, too, the interpenetration of jazz and “learned” music appears significant: if Haydn used folk tunes, a Milhaud, a Kurt Weill or a Stravinsky turn as naturally to jazz, while the ideas of Bartok, Ravel, even of Scarlatti, are not absent from its “progressive” examples.

ATTRACTIVE though it sounds, there are objections to this thesis. For jazz itself is compartmentalized: it has its “learned”, “naive” and “commercial” branches, each appealing to a different audience. Those who appreciate the first and second varieties overlap significantly with the audience for classical music, which is hardly true for the fans of the commercial variety, strangers to connoisseurship in any shape.

Furthermore, jazz only expresses *part* of the total range of experience within the cultures of which it is a product. It does not even aspire to express them whole, or to encompass many of their refinements and complexities. Thus jazz has a layered structure, precisely reflecting that of modern industrial communities. One extreme is shoddy, the other esoteric while the middle ground is strewn with soiled remnants.

If we now try to explain what is going on in sociological terms, we may say that, as societies have become more similar to each other at comparable levels, so they have

been further differentiated internally. The arts have followed suit. People in comparable situations resemble each other more closely, in their ways of life, their mentality and their emotional make-up which governs taste, while being cut off more completely from those whose experiences are essentially dissimilar, even if they happen to be neighbours.

While this has no doubt always been the case to some extent, its repercussions today are much greater than ever before, more rapid in their impact and on the whole, more deliberately organized. Despite certain appearances, there is a lot of spontaneous segregation in the world based not on force and prejudice so much as on the perfectly legitimate desire to pursue one’s own interests and one’s own temperamental preferences, which has led to dependence upon indirect and roundabout means of contact rather than on physical propinquity.

What, in these circumstances, is likely to be the future of music? If one can venture a guess on the basis of visible trends, I should say that music will again tend to become somewhat anonymous, something of a collaborative product and that the remaining free-lancers will be mainly concerned with the technological exploration of the frontiers of sound.

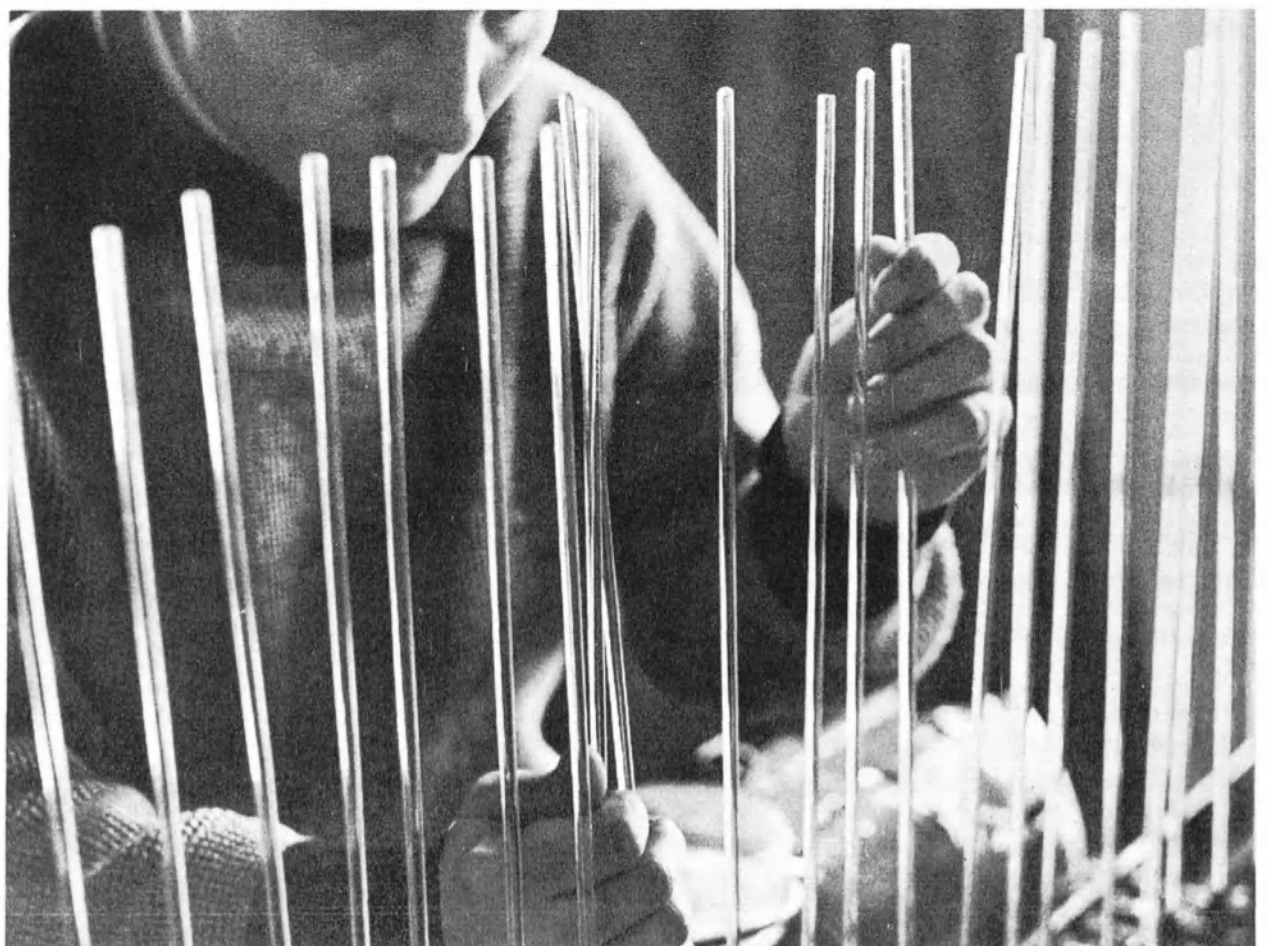
Why? Because interest in, and sympathy for the isolated person and his problems is declining, displaced by interest in groups, in associations and in identifiable mass movements. Also, the percentage of musical participants (i.e. amateur or professional performers) is declining in comparison to the total number of “spectators” (i.e. listeners).

The patronage for music is now in the hands of the controllers of the great institutions—the radio, the cinema, recording companies, the state itself—who are forced to think in terms of wide public responsibility and the economics of mass production and marketing. What is more, the unparalleled accessibility of the standard



EXPLORING NEW FRONTIERS OF SOUND

In the past half century there have been many attempts to extend the frontiers of the world of music. Musicians have experimented with "concrete music" and new tonal forms of music, and even explored the possibilities of new musical instruments. Photos here show the recent efforts of two young Frenchmen, François Baschet, a stringed instrument maker, and Jacques Lasry, who have invented startlingly new types of instruments which bear strange names such as the "pneumatic guitar", "echo screen", "crystal organ" and the "lameliphone". The crystal organ exists in three tonal ranges, one of which, the deep crystal, is shown on left. It has three sounding boards made of steel or duralumin connected to small crystal rods which the player rubs with wetted fingers. The instrument has been used to play revolutionary compositions and classical masterpieces.



Two hands moving along a small forest of rods conjure sounds from the soprano crystal organ that are short and non-resonant.



All photos © Almasy

This strange assembly of metallic domes and "lifebuoys" (above) called "l'homme" (the man) is a new kind of percussion instrument which produces sad, drawn-out tones.

Left, the workshop where Baschet and Lasry have experimented with and built their extraordinary new instruments.

François Baschet inflates a pneumatic guitar (right). One of the simpler instruments he has devised, it has attracted many amateur musicians and soon may be mass-produced.



Future dimensions of music

repertory encourages the use of music quite freely to match the whim of the passing moment. How often do we not twiddle a knob, or change a record, because we don't feel like Rachmaninov in the morning, or because Wagner happens to overwhelm us over tea?

Taking such logic a step further, one can ensure a steady flow of suitable sound by assembling it functionally (Music for Expectant Mothers, Relaxing Tunes, Gay Melodies, the Rhythms of Productivity). Thus one eliminates the personal projections and tensions which composers reflect in successive sections of their works, to obtain a homogenized quantity varied at the behest of the listener alone. From becoming an art which carries the listener beyond himself, music is already largely converted into one which the listener manipulates, so we may expect its patrons to make the consumer's job even easier.

By the same token, composers, instead of seeking a style of their own to give as great a range as possible to what they individually wish to express, may endeavour to discover new sound-combinations (not necessarily made

by instruments) to tickle the fancy of auditors in moods not yet scaled by the output of their predecessors. Already, this is the orientation of what is known as *musique concrète*.

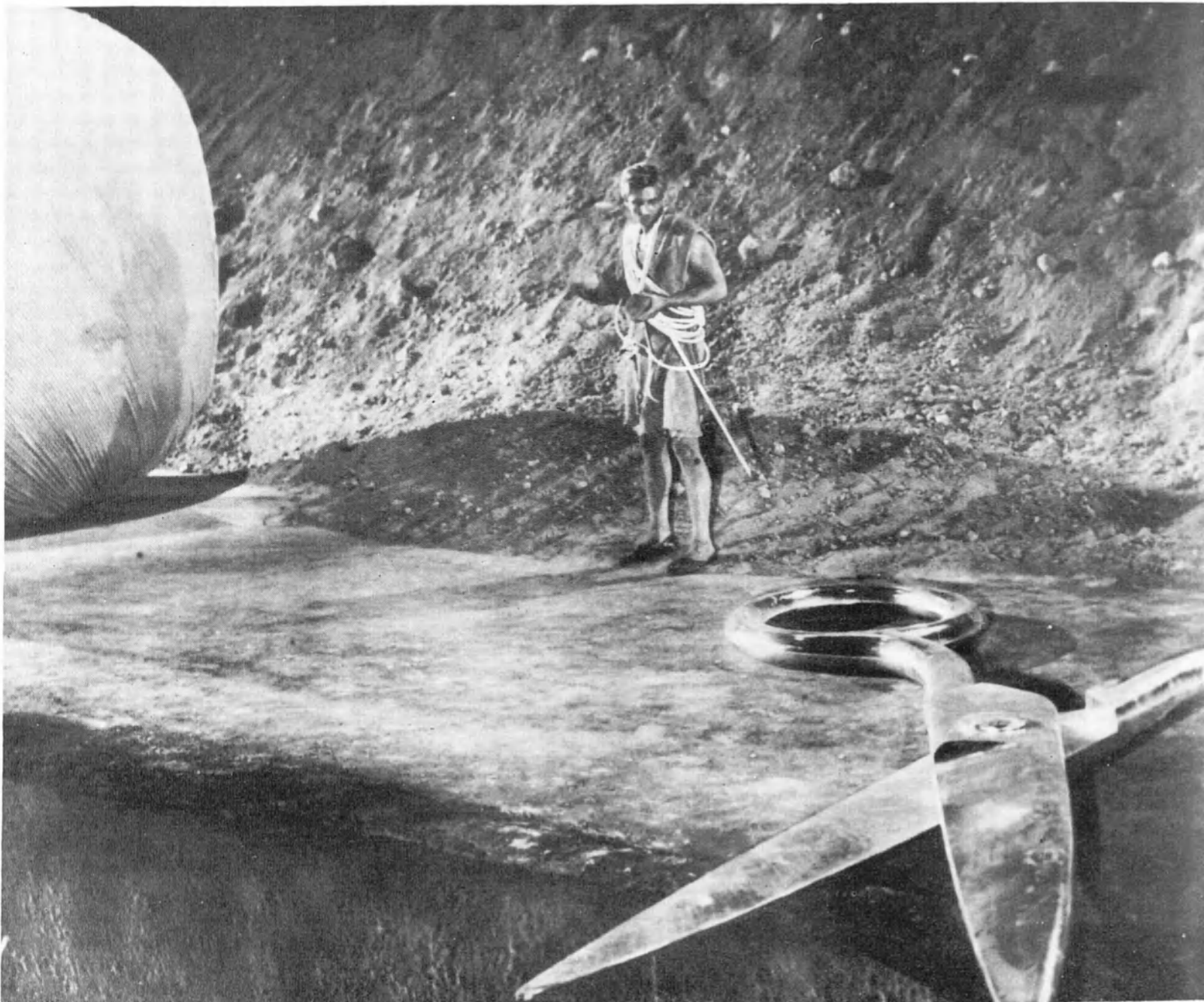
The vision of squads of sound-engineers turning out music in response to preferences revealed by opinion polls and sample surveys is perhaps repulsive. But is it, in fact, any worse than the possessed genius trying to make headway against indifference, or the master craftsman executing a composition to special order?

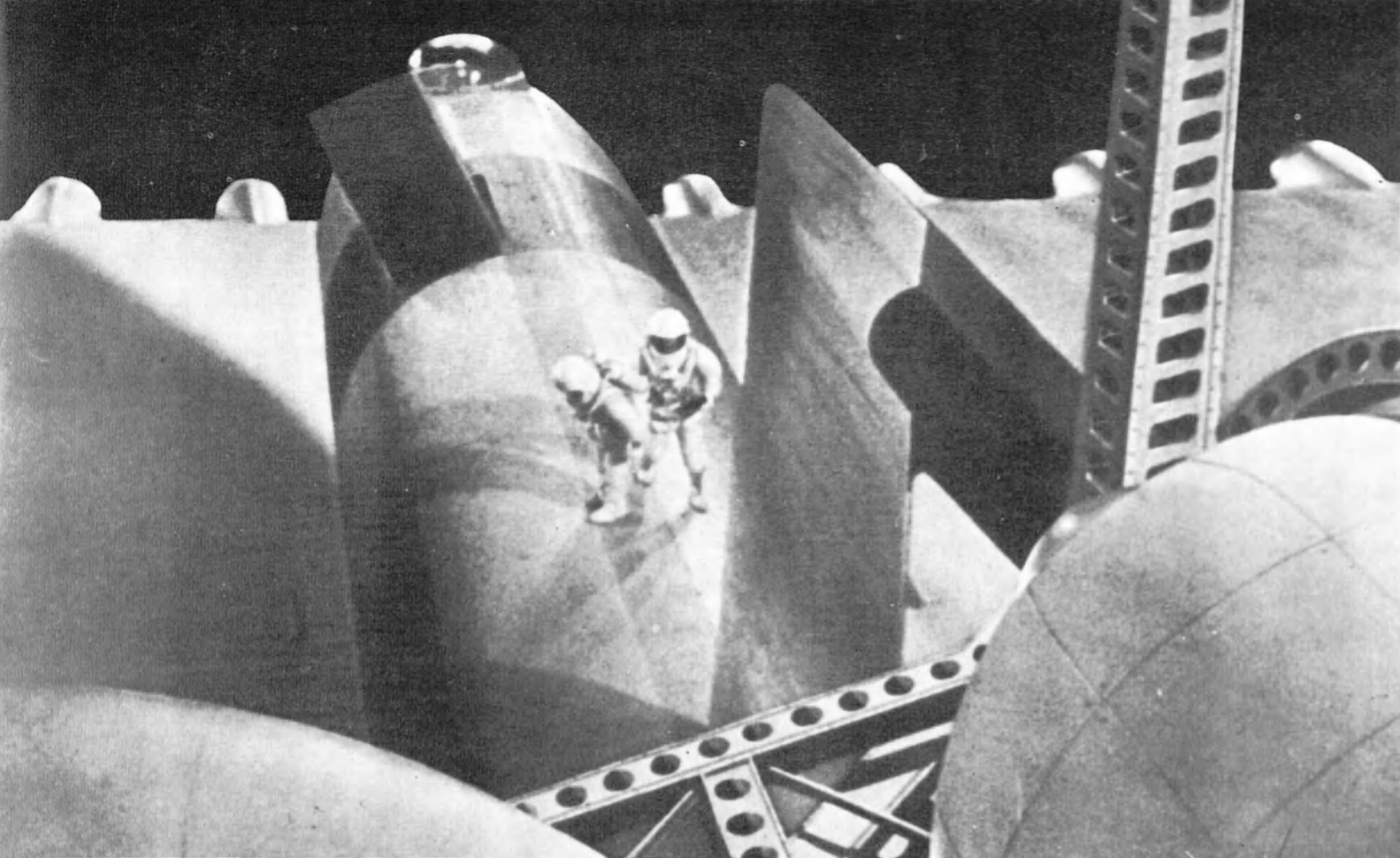
The whole history of Western music is one of conflict between the innovators and the conservatives, between those who reached out for something beyond the already achieved, and those who were automatically outraged by any infringement of the established rules of their day. Possibly, in the coming decades, this conflict will take a different shape: tension between those who stress music primarily in its personal and æsthetic dimension, and those who develop it along lines of utilitarianism and therapy. Which would be perfectly in accord with the wider tensions to which modern societies are subject.

IN DEFENCE OF SCIENCE-FICTION

by
*Arthur C.
Clarke*

On September 27 in New Delhi, the Kalinga Prize for the Popularization of Science was awarded to the British science and science-fiction writer, Arthur C. Clarke. As tenth winner of this award, Arthur Clarke was also the first interpreter of the space age to be so honoured. The prize-giving ceremony was held to coincide with a meeting of the Indian National Commission for Unesco and thus took place for the first time in the country of Kalinga Prize founder, Mr. B. Patnaik, of the Orissa Legislative Assembly. Below we publish Arthur Clarke's address delivered in New Delhi, in which he describes his award as a tribute to his particular field of writing — science-fiction. The idea that artificial satellites might one day be used for relaying radio and television (now become reality with Telstar) was suggested by Arthur C. Clarke as early as October 1945 in an article "Extra-Terrestrial Relays", published in *Wireless World*.





Paramount 1954

Long before rockets and artificial satellites went into orbit around the earth science-fiction writers had already reached the moon and other planets, travelled to the heart of the earth and explored time. Though such forward-looking stories have sometimes evoked their share of

scientific scoffing, some have, in fact, become reality. Novels and films have helped to spread the ideas of spaceflight as in "Conquest of Space" (above) and of possible futuristic mishaps as in "The Incredible Shrinking Man" (left) who gradually diminished to the size of a microbe.

In addition to the pride I personally feel on receiving the Kalinga Prize, I would like to think that it is a tribute to the field of literature in which I have specialized—science-fiction. Although at least four of the earlier prize-winners have written some science-fiction (1), it has been only a minute and incidental portion of their output. I can claim that it is a major part of mine, for I have published just about as much fiction as non-fiction.

Many scientists, I am sorry to say, still look down on science-fiction and lose no opportunity of criticizing it. For example, they often point out that ninety percent of science-fiction is rubbish—ignoring the fact that ninety percent of *all* fiction is rubbish. Indeed, I would claim that the percentage of competent writing in the science-fiction field is probably higher than in any other. This is because much of it is a labour of love, written by enthusiasts who have considerable scientific knowledge and who are often themselves practising scientists.

What role does science-fiction

(1) Ed. note: Julian Huxley ("The Tissue Culture King"); Bertrand Russell (stories from his collection, "Satan in the Suburbs"); George Gamow ("Mr. Tomkins in Wonderland" and "Mr. Tomkins Explores the Atom"); Ritchie Calder ("Forbidden City").

actually play in the popularization of science? Though it often serves to impart information, I think its chief value is *inspirational* rather than educational. How many young people have had the wonders of the universe first opened up to them, or have been turned to a scientific career, by the novels of Verne and Wells? Many distinguished scientists have paid tribute to the influence of these great masters, and a careful survey would, I believe, reveal that science-fiction is a major factor in launching many youngsters on a scientific career.

It is obvious that science-fiction should be technically accurate, and there is no excuse for erroneous information when the true facts are available. Yet accuracy should not be too much of a fetish, for it is often the spirit rather than the letter that counts. Thus Verne's *From the Earth to the Moon* and *A Journey to the Centre of the Earth* are still enjoyable, not only because Verne was a first-rate story teller, but because he was imbued with the excitement of science and could communicate this to his readers. That many of his "facts" and most of his theories are now known to be incorrect is not a fatal flaw, for his books still arouse the sense of wonder.

It is this sense of wonder that motivates all true scientists, and all true artists. We encounter it in the writings of such scientific expositors as Fabre, Flammarion, Jeans, Rachel

Carson, Loren Eisley, as well as many of my precursors at this function; and we meet it again in all scientific romances that are worthy of the name. Any man who can read the opening pages of Wells' *The War of the Worlds* or the closing ones of *The Time Machine* without a tingling of the blood is fit only for "treasons, stratagems and spoils."

The cultural impact of science-fiction has never been properly recognized, and the time is long overdue for an authoritative study of its history and development. Perhaps this is a project that UNESCO could sponsor, for it is obvious that no single scholar will have the necessary qualifications for the task. In one field in particular—that of astronautics—the influence of science-fiction has been enormous. The four greatest pioneers of spaceflight—Tsiolkovsky, Oberth, Goddard and von Braun *all* wrote science-fiction to propagate their ideas (though they did not always get it published!).

In spreading the ideas of spaceflight, science-fiction has undoubtedly helped to change the world. More generally, it helps us to face the strange realities of the universe in which we live. This is well put in an article recently sent to me by a science-fiction "fan" who also happens to be a Nobel Prize winner—Dr. Hermann J. Muller, whose discovery of the genetic effects of radia-

SCIENCE-FICTION ON THE SCREEN

The fantastic imagination of science-fiction writers of yesterday and today is illustrated in scenes from films shown here, from left to right: "The Invisible Man" and "The Time Machine", both by H. G. Wells, "Satellite in the Sky" and "Earth vs. Flying Saucers". Transposed to the screen, in recent years this "literature of a changing world" has made an even wider impact on the man in the street.



Universal Pictures

Literature of a changing world

tion has inadvertently inspired much recent science-fiction and made "mutant" a modern bogey-word.

To quote Dr. Muller (Science-Fiction as an Escape: *The Humanist*, 1957, No 6.): "The real world is increasingly seen to be, not the tidy little garden of our race's childhood, but the extraordinary, extravagant

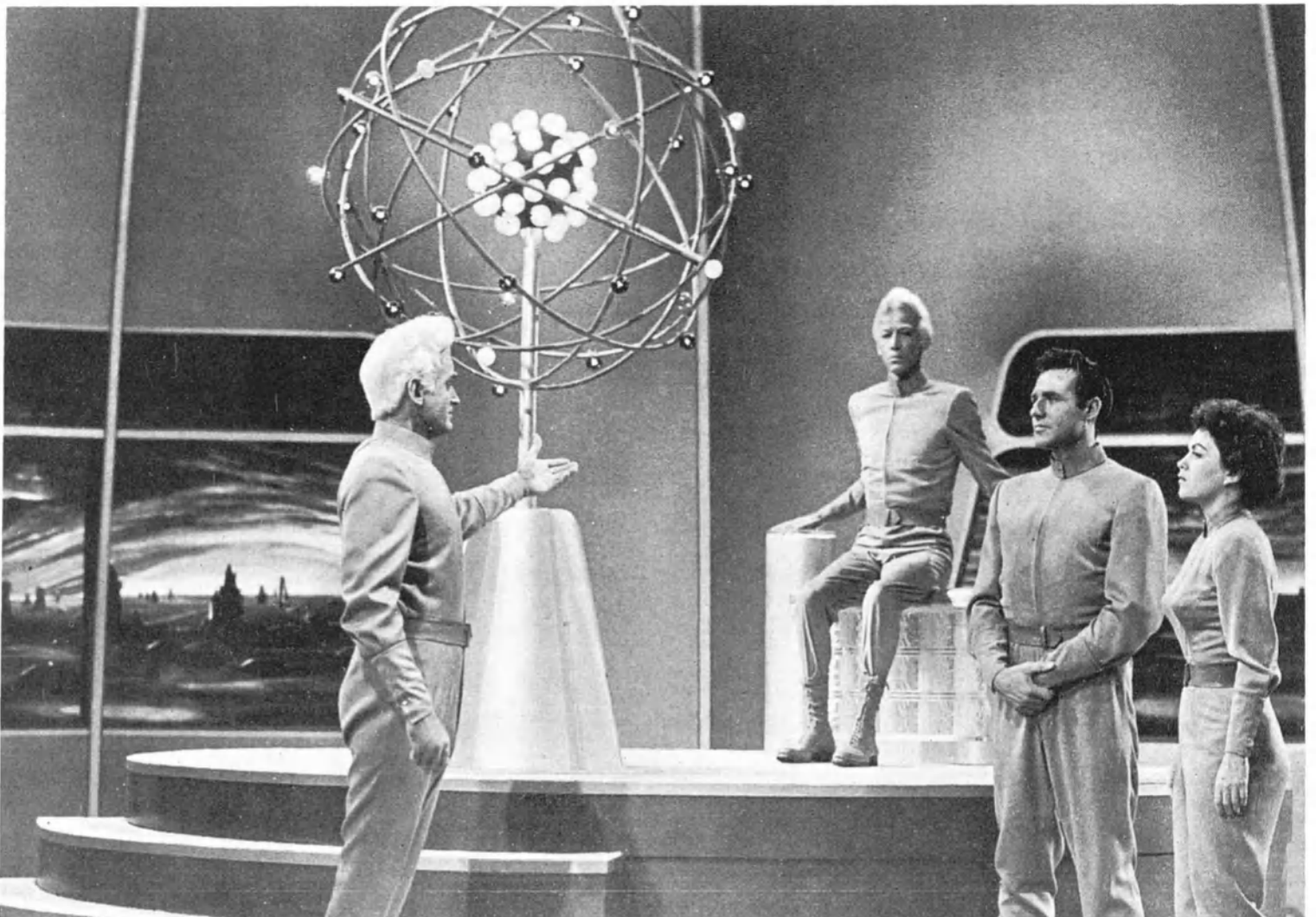
universe described by the eye of science...If our art...does not explore the relations and contingencies implicit in the greater world into which we are forcing our way, and does not reflect the hopes and fears based on these appraisals, then that art is a dead pretence... ..But man will not live without art. In a scien-

tific age he will therefore have science-fiction."

In the same paper, Dr. Muller points out another valuable service that this type of literature has performed. "Recent science-fiction," he writes, "must be accorded high credit for being one of the most active forces in support of equal opportuni-

Science-fiction has encouraged the cosmic viewpoint, quickly making those who read it realize the absurdity of mankind's present tribal divisions. In the film "This Island Earth" (below) two inhabitants of a distant planet named Metaluna outside our solar system return home in their spaceship with two hostages after visiting the earth.

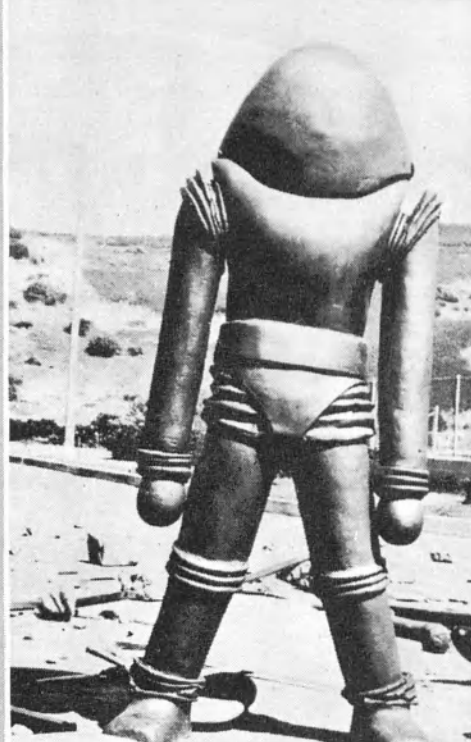
Universal International 1956





M.G.M.

© Warner Brothers



Columbia Pictures

ties, goodwill and co-operation among all human beings, regardless of their racial and national origins. Its writers have been practically unanimous in their adherence to the ideal of 'one free world'."

That, I think, is inevitable. Anyone who reads this form of literature quickly realizes the absurdity of mankind's present tribal divisions. Science-fiction encourages the cosmic viewpoint; perhaps this is why it is not popular among those literary pundits who have never *quite* accepted the Copernican revolution, nor grown used to the idea that Man may not be the highest form of life in the universe. The sooner such people complete their education, and re-orientate themselves to the astronomical realities, the better. And science-fiction is one of the most effective tools for this urgent job.

For it is, pre-eminently, the literature of *change*—and change is the only thing of which we can be certain today, thanks to the continuing and accelerating Scientific Revolution. What we science-fiction writers call "mainstream literature" usually paints a static picture of society, presenting, as it were, a snapshot of it, frozen at one moment in time.

Science-fiction, on the other hand, assumes that the future will be profoundly different from the past—though it does not, as is often imagined, attempt to *predict* that future in detail. Such a feat is impossible, and the occasional direct hits of Wells and other writers are the result of luck as much as judgement.

But by mapping out *possible* futures, as well as a good many impossible ones, the science-fiction writer can do a great service to the community. He encourages in his readers flexibility of mind, readiness to accept and even welcome change—in one word, *adaptability*. Perhaps

no attribute is more important in this age. The dinosaurs disappeared because they could not adapt to their changing environment. We shall disappear if we cannot adapt to an environment which contains space-ships and thermonuclear weapons.

Sir Charles Snow ends his famous essay *Science and Government* by stressing the vital importance of "the gift of foresight." He points out that men often have wisdom without possessing foresight. Perhaps we science-fiction writers sometimes show foresight without wisdom; but at least we undoubtedly *do* have foresight, and it may rub off on to the community at large.

Before concluding, I would like to take this unique occasion of the first Kalinga presentation on Indian soil, to speak about the promotion of the scientific outlook in the East. Though this task is important enough in the West, it is even more desperately urgent here. Two of the greatest evils which afflict Asia, and keep millions in a state of physical, mental and spiritual poverty, are Fanaticism and Superstition. Science, in its cultural as well as its technological sense, is the great enemy of both; it can provide the only weapons that will overcome them and lead whole nations to a better life.

For Fanaticism is incompatible with the open-minded, inquiring spirit of science—with the readiness

to accept the discipline of external reality, even if it conflicts with one's personal hopes and beliefs. The motto of the fanatic is "Don't confuse me with the facts—I've made up my mind." This is the exact antithesis of the Scientific Outlook.

As for Superstition—most of us can remember, though too many people have already forgotten, the events of last February 5. On that date a natural and inevitable grouping of the planets (that has happened about twenty times since the days of the Kalinga empire!) caused needless fear to millions. How many lakhs—if not crores—of rupees were then expended to ward off astral influences? And most of that money was spent by families who could ill afford it.

That was a spectacular example of the evils of superstition, but there are countless others unnoticed by the world. Recently, not far from my home in Ceylon, a villager was bitten by a snake. He could get no medical treatment, because the date was inauspicious; and so he died.

Two years ago Monsieur Jean Rostand, referred to India as "that great nation which welcomes the future without rejecting the past." That is a good policy for any nation—as long as it realizes that there are things in the past that *must* be rejected. Science, which after all is only common-sense raised to the n'th degree, can tell us what to preserve and what to reject. Heed its voice—if not for your own sakes, then for the sake of the lovely, dark-eyed children of Asia and Africa, who are born in millions every year—and die in millions the next. Their only hope of a better future lies in Science combined with Wisdom and Foresight. I shall be happy indeed if any writings of mine have helped towards this goal.

DIGGING FOR HISTORY

An account of excavation in Nubia during 1961-62

by Rex Keating

BRILLIANTLY-COLOURED FRESCOS as fresh as the day they were executed 1,000 years ago were found several months ago on the walls of a Christian church at Faras in Sudanese Nubia. Here, Professor C. Michalowski, leader of the Polish Expedition examines one of the most remarkable of these murals. It depicts the crowned figure of the Archangel Michael protecting Shadrach, Meshach and Abednego from the flames of the fiery furnace into which they were cast by King Nebuchadnezzar. Below, another of the murals at the Faras excavation site is brought to light.



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Unesco-R. Keating



A SMALL felucca traces an erratic course through the broken waters of the Second Cataract. It swings perilously close to a big rapid named Kabuka, whose roar fills the air with sound and then slips to safety under the lee of a rocky islet.

From it springs a young man, Hans Nordstrom. He is an archæologist and member of the UNESCO Mission to Sudanese Nubia which is engaged on an archæological survey of sections of the Cataract area on behalf of the Sudan Government. The islet, Shahgil, is one of many which give to the Cataract its well-merited name "The Belly of Stone".

On many of these islands are the remains of churches and settlements dating from the twilight of Christianity in Nubia; some conceal traces of the much earlier Meroitic civilization, as on Gumnarti where in 1962 the survey team led by Dr. W. Adams found and excavated a Meroitic village.

But Shahgil is a tiny island, too small for habitation, and Nordstrom had little hope of its surrendering anything more than had the score of similar islets over which he had scrambled fruitlessly during the last few



weeks. He was about to climb down from the summit to the boat when his trained eye was attracted to a crevice about five metres above the present high-water level of the Nile. A quick examination convinced him that he had stumbled on a neolithic "fishing industry" site.

Beneath a sand deposit was a layer of fish bones and potsherds some twenty centimetres deep and a thick layer of ash. The bones were large, similar to those of the big Nile perch of today. This it seems was no habitation site but a camp to which the fishermen returned seasonally to fish the big rapid nearby. The fish thus caught they smoked on the spot and removed the flesh, leaving the bones behind when they departed for their homes on the mainland.

Those fishermen casting their nets around six thousand years ago lived on the threshold of recorded history and the discovery may establish a bridge between Neolithic Sudan and pre-historic and archaic Egypt. One of Egypt's archaic kings, Djer of the First Dynasty, has left an inscription—the oldest in Nubia yet found—on the Hill of Sheikh Suleiman not a dozen miles from the Neolithic fishing camp.

This shadowy sovereign, as the inscription records, sent a military expedition to Nubia, around five thousand years ago. Thereafter the mists of time and superstition close in over Nubia for centuries and do not clear until the intrepid Princes of Elephantine, guardians of Egypt's southern frontier with Nubia in the Sixth Dynasty of the Old Kingdom Period, led their expeditions from Elephantine where now stands modern Assuan, up-river into the "Land of the Ghosts" as they fearfully termed the awesome territories to the south. This was around 2400 B.C., and the great caravan captains of that era established trade links with inner Africa which became vital to Egypt's economy and which were to endure, with minor interruptions only, for the next two thousand years.

The tales of their exploits are graven on the walls of their tombs overlooking Elephantine Island where they can be seen to this day by any visitor who takes the trouble to climb the steep cliff to the row of sepulchres that pierce the rock-face. To these men, then, has gone the credit for opening up the road to that stretch of the Nile which today is known as Nubia, and beyond. Or so

CONT'D ON NEXT PAGE

Blast furnaces in the 'Land of the Ghosts'

it was believed, and this belief is reflected in every published work on early Egyptian history.

Then an archæologist's wife taking her dog for its evening walk along the banks of the Nile noticed something in the sand which must lead to a revolutionary re-assessment of Egypt's early relations with Nubia. What Mrs. Emery had seen was a concentration of copper slag, and it led in the winter of 1961-1962 to the discovery by Professor W.B. Emery, who leads the Egypt Exploration Society's Expedition at Buhen opposite Wadi Halfa, of a fully-fledged Egyptian industrial town.

It was a town devoted to the smelting of copper, and the excavators found mortars and stone hammers, and crucibles with pieces of pure copper that had splashed over the edges, still lying where they had fallen some forty-six centuries ago. They found the moulds and finally uncovered the blast furnaces used for smelting the copper.

Most important though, were the pieces of inscribed pottery which were unearthed and the many clay sealings of the type used to secure the bindings around papyrus documents. These sealings demonstrated that the town was in official contact with Egypt and bore the names of kings of the Fourth and Fifth Dynasties including those of the builders of the Pyramids of Gizeh, near Cairo. So that when the first stone of the Great Pyramid was laid, Egyptian vessels were loading pure copper ingots at the quays of an Egyptian town deep inside Nubia. And all this was taking place at least two centuries before the first of the great caravan captains of the Sixth Dynasty was born.

Not least among the tantalizing vistas opened by this discovery is the whereabouts of the source of the copper ore which is of very high quality. The Egyptians, an intensely practical and conservative people, always worked their copper as near as possible to its source, a source which must have been considerable since the furnaces were worked for at least a hundred years. Copper is a valuable commodity; will the mines be located and if found will they prove to be still rich in yield?

At the very end of the 1962 digging season, Professor Emery cut a trench across the whole town-site and came across buildings one below the other down to a depth of four metres. The large size of the mud-bricks in the lowest levels provided a clue to their date, which may extend back to the Archaic Period—to the First and Second Dynasties. Next season's digging at Buhen promises exciting revelations.

To add point to Professor Emery's revolutionary findings is the discovery, made also in 1962 by the Franco/Argentine Expedition led by Professor J. Vercoutter, of an Archaic Egyptian cemetery not twenty miles from Buhen containing sealings of the First Dynasty.

All in all, therefore, it now looks as though the Egyptians had a strong foothold in Nubia possibly five hundred years earlier than the historians tell us, and that they lost control of the territory so completely that by the time of the explorers of the Sixth Dynasty Nubia had

ten miles north of Buhen I watched some twenty Nubian workmen with ropes and wooden beams heave and strain at a great rock lying buried in rubble. The rock stirred and excitement mounted until with a mighty heave it lifted out of the hole, teetered for a moment, then toppled down the side of the hill amid shouts of delight.

THE hill, called Sidi Qurnein, stands some two hundred yards from the west bank of the Nile and its flanks merge into a desert which stretches across an entire continent to the Atlantic, three thousand miles away. Here there can be no life save that bequeathed by the river surging north to the distant Mediterranean.

This is the spot where in the sixteenth century B.C., a prince, Prince Amenemhet, of what is now called Debeira, chose to excavate his tomb, and here, three thousand five hundred years later a group of archæologists from Scandinavia re-opened it. When the great stone fell it revealed the top of a shaft cut vertically in the rock to a depth of twenty-two feet and at the bottom was a passage leading off into darkness. This is the moment which provides the field archæologist with his greatest thrill; will the tomb be intact or will the ancient robbers have got in first?

The passage was forty feet long and its floor was covered with pottery vases, among them a plaque inscribed with the figure of the goddess Nut and several canopic jars bearing the name of Amenemhet's brother, Djehuty-hotep, Prince of Teh-khet, whose tomb is across the river on the opposite bank. The burial chamber was empty but several small objects left behind by the robbers hinted at the richness of the original burial.

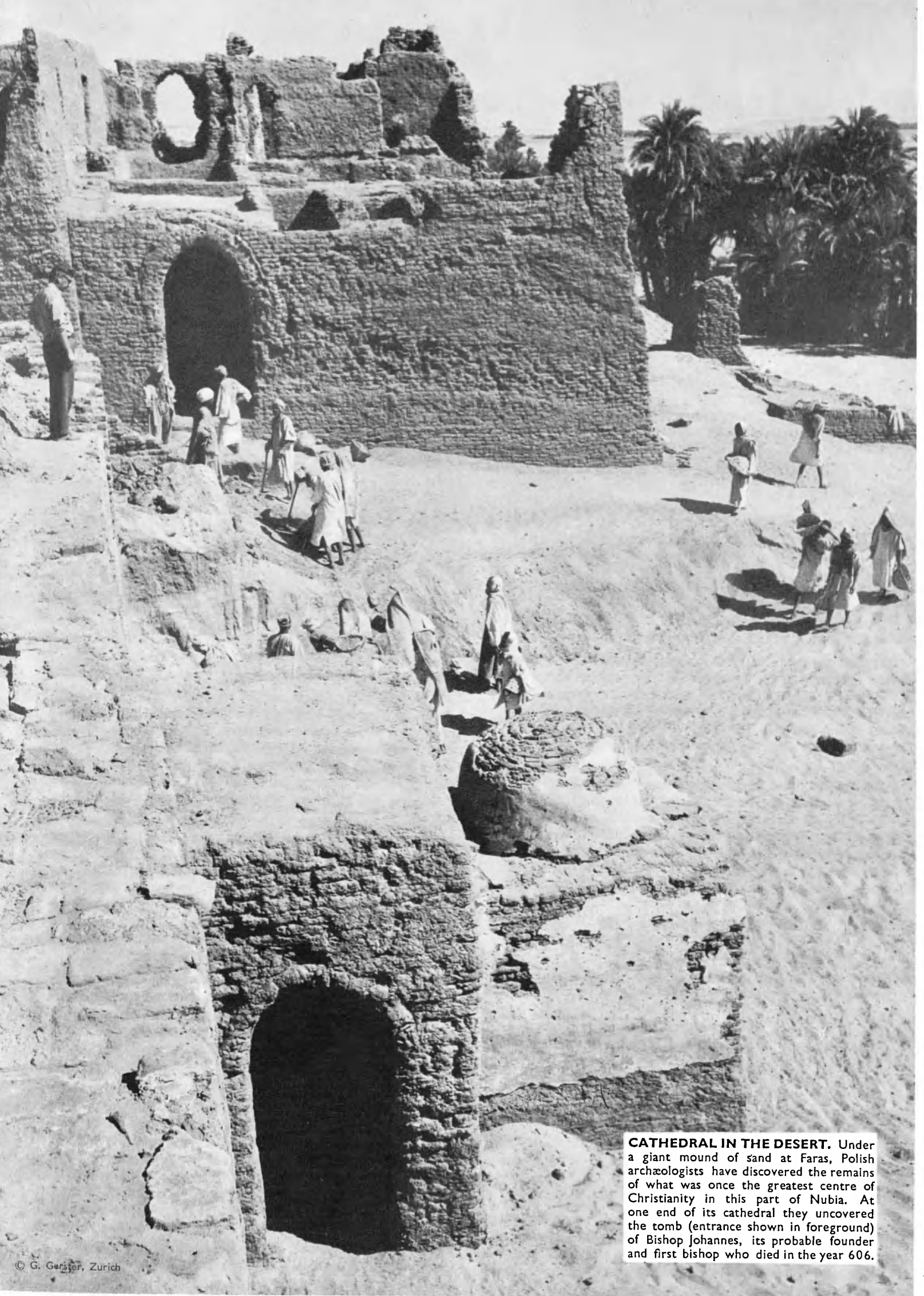
THE really valuable find was in the tomb chapel a little further down the hill where Professor Säve-Söderbergh, who leads the Scandinavian Joint Expedition, found leaning against the wall of the shrine, the finest stela yet discovered in Nubia. On the grey granite are the names and titles of Prince Amenemhet and the beautifully incised hieroglyphs are filled with yellow paint as fresh in colour as the day it was mixed.

Prince Amenemhet and Djehuty-hotep were Nubians who had become so Egyptianized that there was nothing in their names, titles and form of burial to distinguish them from true Egyptian grandees of the Eighteenth Dynasty, living around 1500 B.C. The brothers illustrate the final stage in the long process of Egyptian domination of Nubia, a process which had begun about a thousand years earlier, in the period when the Princes of Elephantine of the Sixth Dynasty were leading their expeditions south into the Land of the Ghosts.

This was the time when a mysterious people, known to archæologists as the "C-group" to distinguish them from their predecessors the "A" and "B-group" peoples, appeared in Nubia, possibly from the south or west. They were a people well-organized and skilled in the art of war and were almost certainly the enemy against whom the Egyptian kings of the Twelfth Dynasty built

In the first weeks of this year, on top of a rocky hill

CONT'D ON PAGE 22



CATHEDRAL IN THE DESERT. Under a giant mound of sand at Faras, Polish archaeologists have discovered the remains of what was once the greatest centre of Christianity in this part of Nubia. At one end of its cathedral they uncovered the tomb (entrance shown in foreground) of Bishop Johannes, its probable founder and first bishop who died in the year 606.

Thirty tombs unearthed per day

around 2000 B.C. the line of protective fortresses along the length of the Second Cataract, fortresses which even today can excite wonder by their sheer strength and ingenuity of design.

Yet within five hundred years of their arrival in the area this formidable people apparently vanished from Nubia without trace. Intensive excavation of their cemeteries, however, during the 1962 season has solved the riddle of their fate. The area of Debeira, where the Danes, Finns, Norwegians and Swedes of the Scandinavian expedition were at work is particularly rich in C-group remains.

Working against time—for all these cemeteries are doomed to be swallowed by the flood waters of the High Dam—and using the latest tools of field archæology, the Scandinavians were clearing and recording up to thirty graves a day. The clearance of several C-group cemeteries was also undertaken by the Spanish Expedition under the direction of Prof. Blanco y Caro.

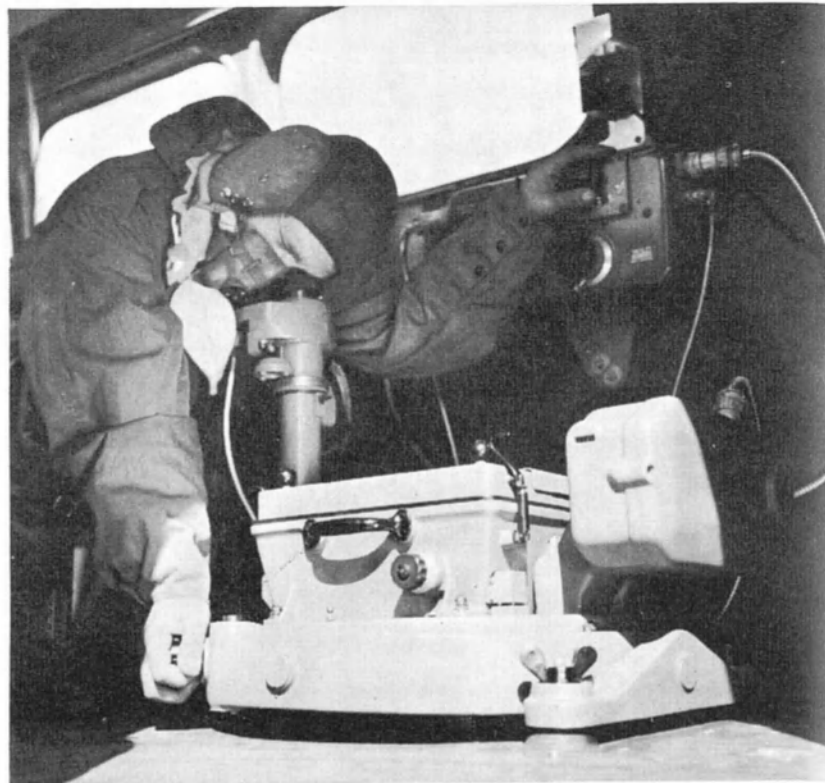
THE thousands of objects recovered and the design of the tombs themselves have revealed how over the centuries the C-group culture was peacefully, yet inexorably, absorbed by that of the Pharaohs, so that by 1500 B.C. the native princes of Debeira have become culturally indistinguishable from Egyptians.

Unfortunately the early C-group people, who were great cattle breeders, seem to have had no written language so that all that is known of their customs derives from their curious circular graves. Buried outside several such graves, near Faras, which lies just on the Sudan side of the frontier with Egypt, Hans Nordstrom found a number of ox skulls.

This was a common practice among the early C-group people, but what made the Faras skulls interesting was that the tip of each left horn had been bent downwards and forwards artificially. This custom of bending down the left horn of cattle is known from tomb paintings to have been practised during the Old Kingdom Period around 2500 B.C. and much later during the Meroitic around 600 B.C. What is remarkable is that the Nilotic peoples of the Southern Sudan—the Dinkas and Shilluks—follow the custom to this day; it is, they say, a tradition that came to them a very long time ago.

Houses of the C-group people are extremely rare so there was excitement when in 1962 three C-group dwellings were found by the Scandinavians and a fourth by the expedition of the Oriental Institute of Chicago. So, painstakingly, the field archæologists working in Nubia are piecing together the history of this enigmatic C-group people. They have discovered what became of them, how their culture was completely absorbed by that of their great northern neighbour, but have yet to solve the riddle of the origins of the C-group.

Buhen was the military headquarters of the Second Cataract area and nerve-centre of the dozen or so fortresses built around 2000 B.C. to keep the C-group people in check. Five hundred years or so later Queen Hatshepsut and the Pharaoh Thutmose III built a stone temple inside the citadel of the old fortress. Today it is the finest temple in Sudanese Nubia and is one of the monuments scheduled for removal to safety before the flood waters close over it. Professor Emery, working on behalf of the



Unesco-Keating

Egypt Exploration Society, hopes to start work on this rescue operation at the end of this year.

Moving inscribed and painted walls and columns which have been weakened by exposure to thirty-five centuries of burning sunshine and bitter nights, is an extremely tricky business and Professor Emery proposes to take a leaf out of the ancient builders' book. To dismantle the temple he will in effect reverse the process they used in building it.

The temple will be filled with sand and the stones manhandled by local Nubian workmen straight onto the cushioning surface without the necessity of lifting. As each course of stone is removed so the level of sand will be correspondingly reduced until the temple pavement is reached. This method will obviate the use of machinery which, apart from being difficult and expensive to get to Nubia, could damage the extremely friable sandstone.

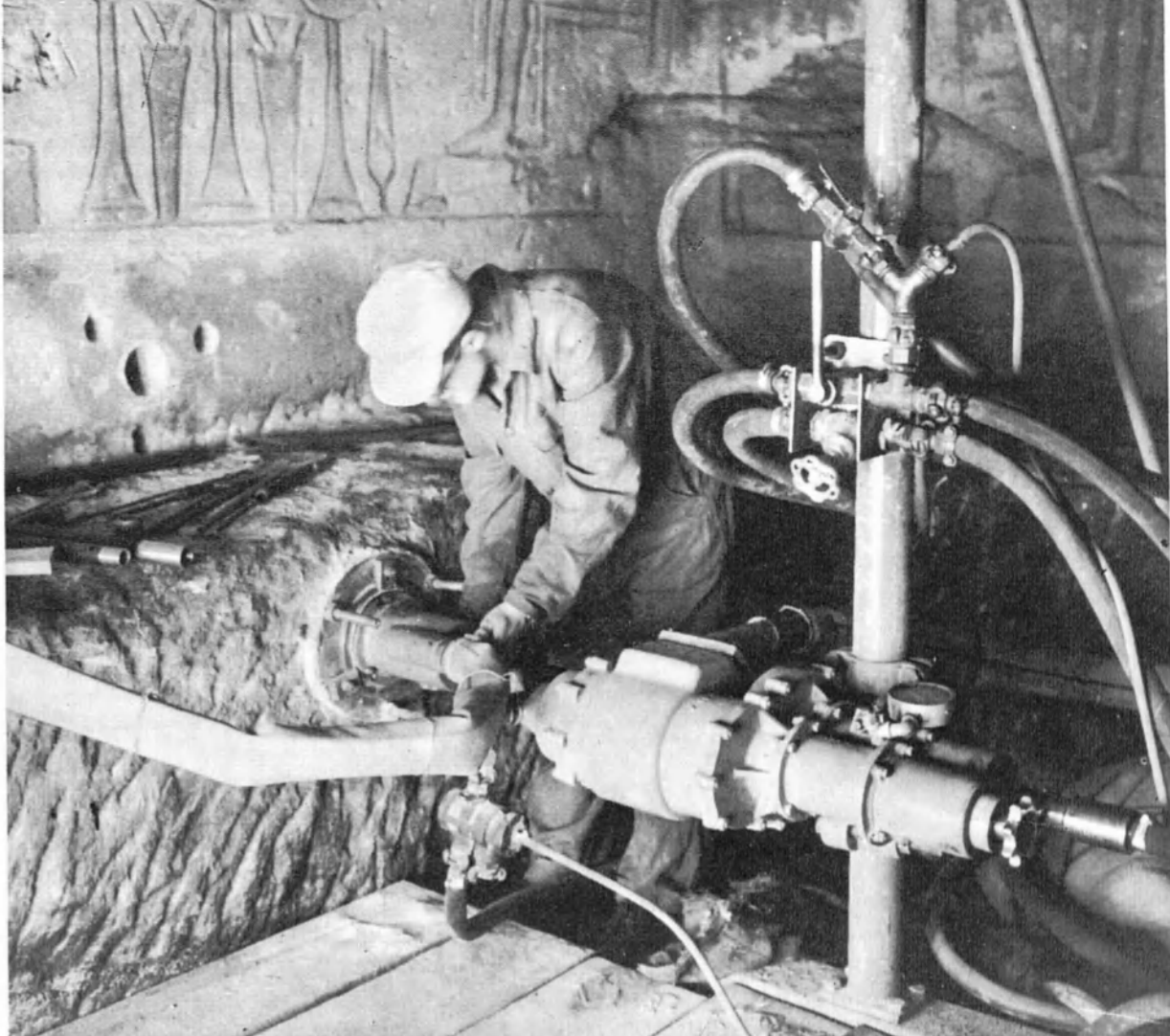
The area beneath the existing temple is practically the only part of the fortress which has not been systematically cleared, and immediately the temple has been removed Professor Emery will start digging down to the original foundations of the citadel. He may uncover a second temple—or find nothing of interest!

Another temple threatened by the forthcoming flooding is Kalabsha, largest in Nubia after Abu Simbel. It is a Græco-Roman edifice thirty-five miles south of Assuan. Unlike Abu Simbel which can only be protected in situ, Kalabsha will, despite its great size, be dismantled stone by stone and responsibility for this most delicate operation has been assumed by the Federal Republic of Germany. Festooned in scaffolding, the temple today is being systematically taken apart for reconstruction elsewhere in Egypt.

Five miles upstream from Buhen and on the island of Meinarti is a large mound believed to conceal another

DIAMOND DRILL IN TEMPLE.

In the Great Temple of Abu Simbel tests have been made to check strains in the rock during preparatory studies of the plan to encase the entire temple in a concrete block and raise it 200 feet up the side of the mountain from which it is hewn, thus saving it from the invading waters of the new Aswan Dam. Right, diamond-tipped drill operated by a Swedish engineer cuts holes in the temple walls. The drillings will be used to house instruments for measuring the internal pressures in the rock. Left, high over Sudanese Nubia an automatic camera is used for a large scale aerial archaeological survey. With this all-seeing eye, scores of hitherto unsuspected archaeological sites have recently been discovered.



Unesco-Keating

of the Twelfth Dynasty fortresses. The mound was, by the way, used as a gun platform during the River War against the Dervishes towards the end of the nineteenth century. Meinarti will be excavated by the Egypt Exploration Society when their work at Buhen is completed.

ANOTHER of the fortresses, Mirgissa, some ten miles south of Meinarti, is to be excavated next year, by the Franco/Argentine Expedition. Already the foundations of an Egyptian town of the period have been located on the banks of the river below and when this is dug it may well reveal valuable indications of how the inhabitants of a Nubian garrison town lived some four thousand years ago.

At Serra, a mile or so inside the Sudan border with Egypt, is yet another fort and in 1962 it was cleared down to the foundations, and the layout of the fortifications was thoroughly examined and recorded, by the Expedition of the University of Chicago's Oriental Institute, directed by Dr. Keith B. Seele.

Inside the fortifications awaiting excavation next season are several interesting buildings of early Christian date. They are contemporary with the large Christian town across the river on the west bank. Here the University of Ghana Expedition under Professor P. L. Shinnie has uncovered an astonishing complex of buildings. What started as a mudbrick church around the seventh century of the Christian era grew over the next eight hundred years into a large town with layer upon layer of buildings so numerous that, according to Professor Shinnie, it would need at least ten seasons to clear it.

Nothing could illustrate more vividly than this town the intensive occupation of Nubia during Christian times, from its conversion under the Emperor Justinian in the sixth century to its final eclipse by Islam in the fourteenth

century. Indeed only a few miles down-stream from Shinnie's "dig" is Faras, ancient capital of Nobatia, the northernmost of the three early Christian kingdoms of Nubia and the Sudan.

Here under mountains of sand lie dozens of ancient sites covering an area of some five square miles, and here during 1961-1962 the Polish Expedition led by Professor C. Michalowski has been making spectacular discoveries. The huge mound on the river's edge at Faras, on which the expedition's members have been concentrating, has now been revealed as nothing less than a great church and associated buildings, containing brilliantly coloured frescoes as magnificent as they are wonderfully preserved.

The tombs of at least eight of the Bishops of Faras (its ancient name was Pachoras) have been found, the earliest being that of Johannes who died at the age of 82 in the year 606 and who was probably the first bishop of Faras.

Beneath the church are the stones of a temple built by the Pharaoh Thutmose III two thousand years earlier and below that, possibly, another Middle Kingdom fortress. Nearby is a fortress of the Meroitic period, not yet dug. Truly, Faras is a field archaeologists' paradise!

When Christianity came to Nubia there was living there another of those alphabetically identified cultures, in this case the "X-group" people. Like the C-group, their origins are unknown and they have left no written language. The unrobbed tombs of their kings were discovered at Ballana and Qustul some fifteen miles north of Faras on the Egyptian side of the border.

That was in 1931 and W. B. Emery assisted by L. P. Kirwan cleared scores of tombs which yielded a fantastic quantity and variety of valuable objects. In 1961 Emery did it again, finding two large unrobbed tomb magazines

Footprints 15 centuries old

in an X-group cemetery at Kasr Ibrim, north of Abu Simbel.

X-group cemeteries are common in Nubia and several were dug by most expeditions in the 1962 season, but the huge tumulus-graves were usually found plundered. A number of bodies came to light, however, in many cases rather too well preserved by the bone-dry sand of Nubia to be comfortably handled.

In one of these cemeteries the Unesco mission found in a trench alongside one of the tumuli thirty-six neatly stacked baskets abandoned or forgotten by the labourers who made the mound some fifteen hundred years ago. They were perfectly preserved and look very much like the baskets one can buy nowadays in Wadi Halfa market. In a grave nearby were several pieces of bread.

This X-group cemetery is on a plain consisting of a deep deposit of greyish sand intermixed with shells, clearly the alluvial deposit of an ancient river. The deposit slopes upwards towards the surface and while digging another of the graves, Nordstrom found below the top stratum of sand a number of footprints of adults, children and camels, following what appeared to be a path in the direction of the river which nowadays is at least a kilometre away.

The footprints were about a metre below the surface and Nordstrom followed them down for about six metres to where they disappeared under the next lower alluvial deposit. The footprints being beneath the graves show that the people and animals who made them lived at the very beginning of the X-group period or immediately before it.

The footprints were no more than half a dozen miles from the Neolithic "fishing industry" described at the beginning of this article, yet in time they are separated by fifty centuries and more. This seems a tremendous weight of years and, in truth, it very nearly spans the whole of man's recorded history. But to the pre-historians and geologists of the Columbia University Expedi-

tion led by Dr. Ralph Solecki and Dr. Rhodes W. Fairbridge, a figure such as this is insignificant.

Surveying the east bank of the river from the Second Cataract down to the frontier in 1962, they found numberless artifacts, "workshops" and habitation sites indicating that in Palaeolithic times this reach of the Nile was heavily populated. All these remains—among them were two fossilized skeletons, probably of homo-sapiens—came from the tops of eroded hills that stand in the desert a mile or so back from the Nile.

THESE hills are really terraces and are all that remain of the ancient plateau down through which the Nile has cut its way for around one hundred and fifty feet. Fossil soil and mineralized roots of plants led the geologists in the expedition to the conclusion that the present bed of the Nile is no more than 25,000 or 30,000 years old, and that the surrounding desert is an even more recent feature of the landscape.

The pre-historians visited Abu Simbel, which lies twenty miles or so down-river from the Egyptian/Sudan frontier, and on the hills above the temple they found many Stone-Age artifacts.

There is reason to believe that the mountain of Abu Simbel was regarded as a holy-place long before the masons and sculptors of Rameses II fashioned the rock-face into two of the most splendid temples to come down to us from the past. In 1962 I made a pilgrimage to this shrine of Rameses, my second in two years. But how changed was the scene when I stepped onto the beach in the first light of dawn!

A pneumatic drill flung back echoes from the cliff face and to its din was soon added the roar of diesel engines. Nor was this all. The narrow strip of beach was packed with men, women and children laden with cameras, and drawn up at the water's edge were the three large tourist steamers that had brought them to see the temples.

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GRAVEYARD FIND by Scandinavian archaeologists near Debeira (left) is one of many which help specialists to reconstruct the life and customs of Nubian peoples who left no written history. In this grave were the bodies of a woman and a child. Specialist here is removing a gold mask from the woman's skull. Below, a cache of baskets discovered in a cemetery on the shores of the Second Cataract of the Nile by a Unesco Mission. Left by workmen who built the tomb 1,500 years ago, baskets look much like those that can still be bought in nearby market at Wadi Halfa.

Nordstrom-Unesco





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PRINCE'S TOMB. At Debeira West (above) Sudanese workmen, watched by Professor T. Säve Söderbergh, leader of a joint Scandinavian expedition, heave and strain at a great rock blocking the burial shaft leading to the tomb of Prince Amenemhet, a 16th century B.C. Nubian ruler.

Nearby, barges and lighters were unloading timber, scaffolding and masses of other equipment. Rows of tents lined the bottom of the cliff and among them technicians and workmen were already astir. Truly Abu Simbel had undergone a metamorphosis in the two years since the Nubian Campaign started.

I went into the Great Temple and there in one of the innermost chambers was an even more startling intrusion from the twentieth century. At one end of the narrow rock-cut chamber an ultra-modern piece of machinery was filling the place with sound, so that one could imagine that the very figures of the gods staring down from all sides were trembling with the vibrations of the diamond-tipped drill. Bending over it, in the glare of a spotlight, was a young Swedish engineer, seemingly oblivious of the wild incongruity of the spectacle.

The machine was cutting smooth cylinders of sandstone from walls, ceiling and floor to make way for sensitive instruments. With these a group of mining engineers from Sweden were to measure the vital forces which exerting pressures within the mass of rock hold the temple in balance and which, if disturbed haphazardly, could bring about its collapse.

The lifting of such great masses of rock, the larger—that containing the temple of Rameses—weighing around

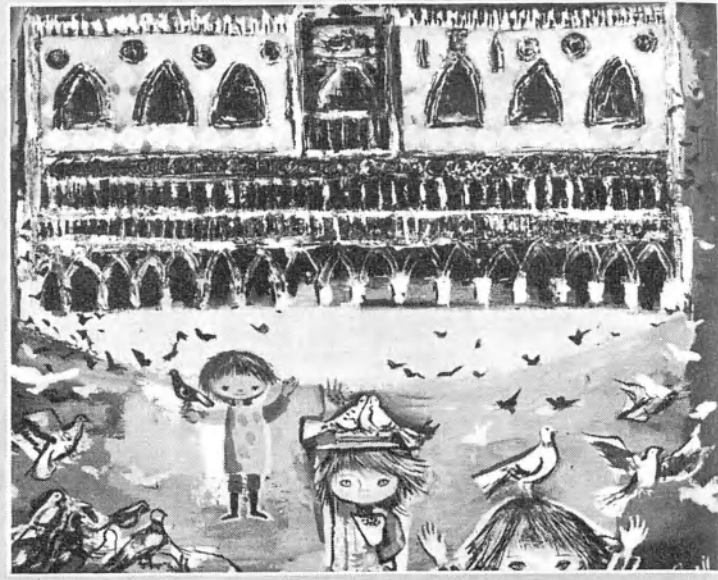
a quarter of a million tons, to a height of two hundred feet and more, represents a feat of engineering that is breathtaking. Yet for two years now, men representing a score of disciplines and as many countries have converged on the temples and have probed and surveyed, analysed and calculated.

The science and technology that can put a man into orbit and fling rockets at the moon is more than equipped to preserve even so fragile a monument as Abu Simbel. The world's technical resources stand ready, only the funds are needed to launch the most spectacular rescue operation of our time.

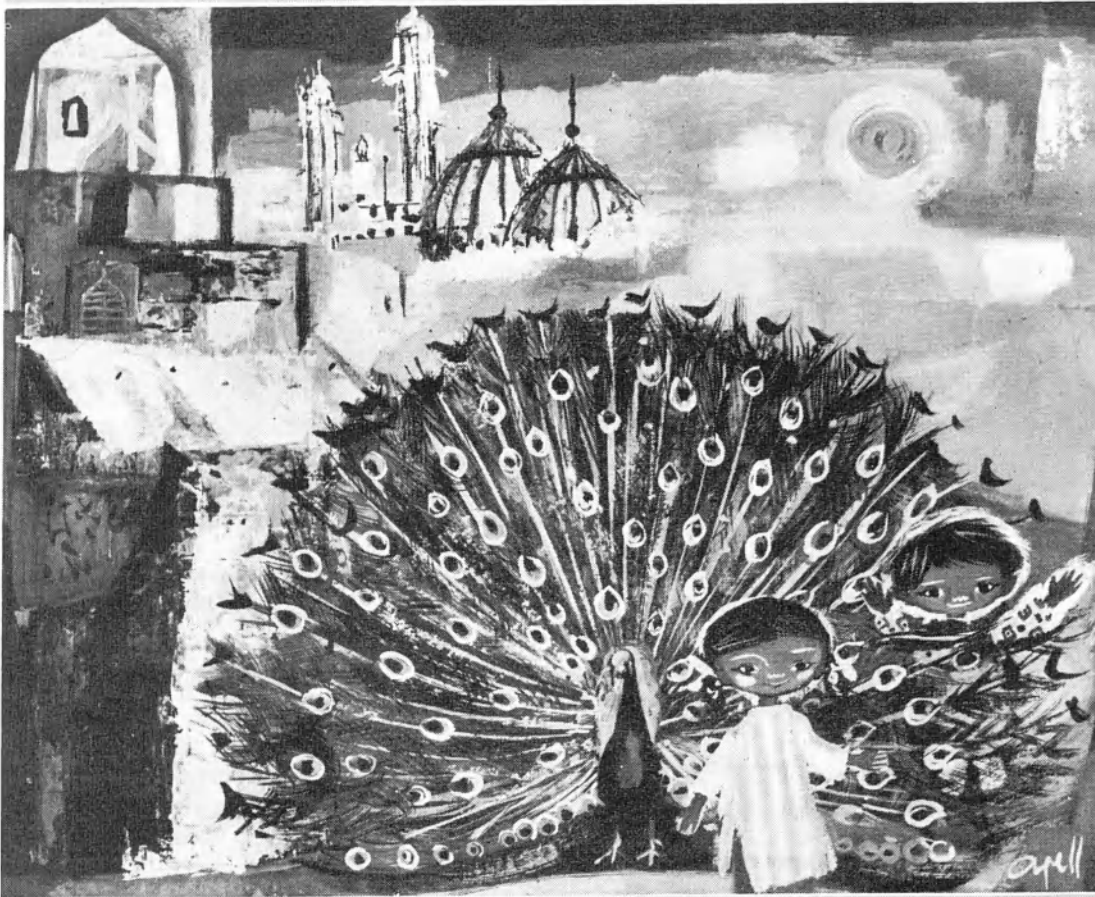
REX KEATING of UNESCO's Radio Section has devoted many years to the study of the history and archæology of ancient Egypt. He has travelled widely in the Sudan and in Egypt and other countries of the Middle East where he lived for many years. Mr. Keating has led several UNESCO radio missions into the areas of Nubia to be flooded by the Nile and again visited Nubia earlier this year to gather material for the above article. His profusely illustrated book, "Twilight of the Gods" on the same subject is to be published this month in the United Kingdom by Rupert Hart-Davis Ltd. (42/-) and in the U.S. by Harcourt, Brace and World, Inc. (About \$ 7.50).



Macaws and Toucan...
with South American children



Pigeons... and
children of Venice



Peacock... and
Indian children

FESTIVAL OF BIRDS

In a series of five paintings about two of the most fascinating inhabitants of our planet—children and birds—Roser Agell, a young Spanish woman has created UNICEF greeting card designs that are gay and brilliantly colourful. Each design in "The Festival of Birds" captures perfectly the delight taken by youngsters in winning the trust of their feathered friends.

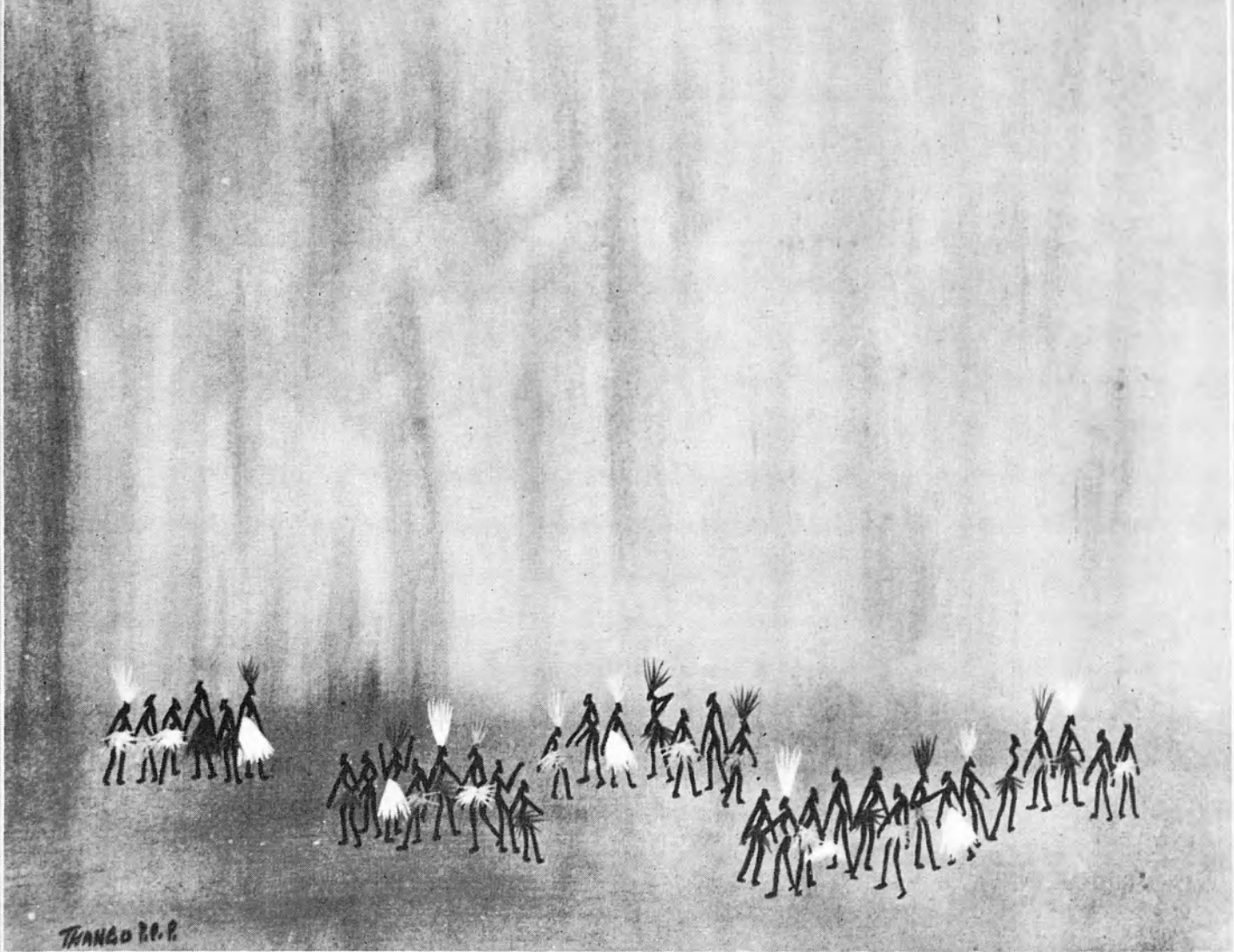
UNICEF

Cardinal and Chickadees...
with North American children



Flamingo and Crowned Crane...
with African children





CEREMONIAL DANCE by the young Brazzaville (Congo) artist, François Thango

GREETING CARDS

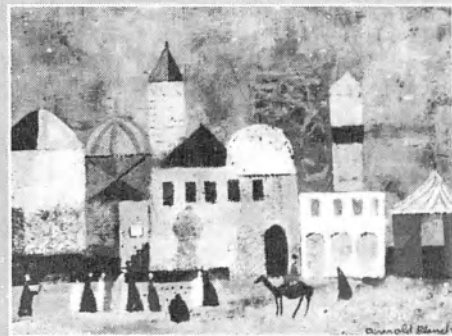
Through its programmes to help governments meet the urgent needs of their children for medical care and adequate food, UNICEF (United Nations Children's Fund) is currently reaching 60 million children and their mothers. The opportunity to have a personal share in these programmes is given by UNICEF greeting cards which have raised nearly \$5 million since they were put on sale in 1950. In 1961-62, 21.5 million cards were sold in over 100 countries. This year it is hoped to increase this figure to 25 million. The 1962/63 cards comprise 12 designs (some of which are reproduced here) by seven artists. Representative of a new group of African painters, known as the Poto-Poto (a district in the city of Brazzaville, Congo) school are Raphael Mounkala (Blessing of the Hunt) and François Thango (Ceremonial Dance). A teen-age artist, Garya Mahmoud, of Egypt, has contributed "Joy of Living", a detail from one of her weavings. U.S. artist Arnold Blanch has contributed two designs, "The Herald" and "The Pilgrims" and another U.S. painter, octogenarian Leo Schutzman has donated "Winter Carnival". Swiss artist, Max Hunziker is represented by "Compassion", symbolizing the United Nations. Finally, Roser Agell of Spain, well-known for her murals, frescoes and paintings, has designed a series of five under the title "The Festival of Birds" (see opposite page). UNICEF cards



come in boxes of ten—at \$1.25 (U.S.A.); 7/6 (U.K.) and 5 NF (France) per box — each box sold can provide enough DDT to protect five children from malaria for a year or one child with a daily glass of milk for eight months.

★

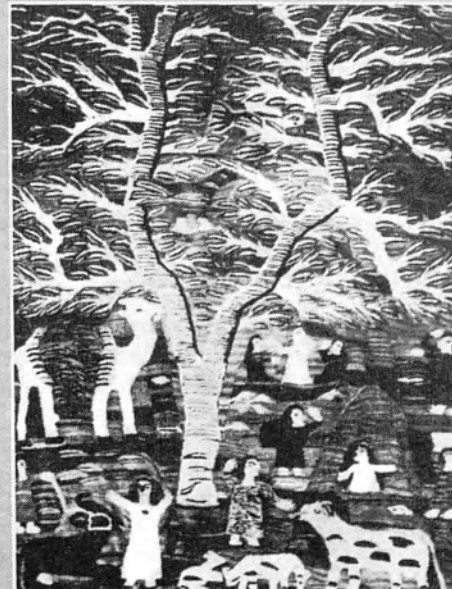
For further information, orders, etc., write UNICEF Greeting Card Fund, 13 Heddon Street, London W.1; United Nations Association in Canada, Committee for UNICEF, 280 Bloor Street West, Toronto 5, Ontario (Att. Mrs. G. Richards); U.S. Committee for UNICEF, POB 22, Church Street Station, New York 8, N.Y. (Att. Miss Olga Gechas) or UNICEF, Service des Cartes de Vœux, 24, rue Borghèse, Neuilly-sur-Seine, France.



THE PILGRIMS
by Arnold Blanch (U.S.A.)

WINTER CARNIVAL by
U.S. artist Leon Schutzman

JOY OF LIVING by 16 year old
Garya Mahmoud (Egypt)



THE RISE AND FALL OF GREAT CIVILIZATIONS

The Western world has not always a full understanding of the past achievements in science and technology of other peoples who, however, did not experience the scientific and industrial revolution that has given birth to the modern technological world. Some of the former accomplishments of these peoples along with the problems raised by traditional attitudes in the transition from a rural culture to a machine-conscious urbanized society are discussed in this, the third article in a series which began publication in our July-August issue. They are taken from a new study produced by the United Nations and shortly to be published under the title "Aspects of Underdevelopment: The Background to Freedom from Hunger."

THE question has often been asked why certain areas of the globe saw the rise of "modern" scientific and technological knowledge and others did not.

It is a commonplace that the fundamental discoveries which made civilization possible—fire-making, tool-making, agriculture, building, calculating, writing, money—were all apparently made outside the area which has given us the marvels of modern science. Nor were the mathematical and scientific concepts upon which modern industrial society rests, themselves of Western origin, as is so often believed.

Before the Christian era, peoples such as the Egyptians, the Babylonians, the Chinese, the Hindus and the Greeks all made important contributions to human thought and to practical engineering. It is likely that today's world has inherited only a fraction of the vast store of knowledge accumulated by earlier peoples. Much may have been lost, like the marvellous art of the gem carvers which disappeared with the Roman Empire, after more than 2,000 years of achievement, or like the stained glass techniques of Chartres and the Sainte Chapelle, which are the despair of modern craftsmen. If this is the case, we shall never know how often we tread in the footsteps of some daring, but forgotten, thinker whose papyri parchments or clay tablets have returned to dust.

However that may be, the modern Western world has not always a full understanding even of those achievements of other peoples about which no doubt exists.

Few save professional archaeologists realize the scale on which the peoples of the Ancient East carried out such engineering projects as irrigation schemes. In the Twelfth Dynasty of Egypt, the Pharaoh Amenemhet III brought much of the Nile Valley under cultivation, causing its waters, when they reached a dangerous flood level, to be diverted into the escape reservoir of a depression in the Fayyum which his engineers converted into an artificial lake of great dimensions. At about the same time, the Babylonians brought the river Euphrates under control and caused its waters to flow into artificial ponds covering 650 square miles, in which the water stood twenty-five feet deep during the flood season.

For scores of generations, the Chinese worked their miracles with jade, bronze, ivory and silk in almost complete isolation from the cultures of Europe. Meanwhile, they were inventing the mariner's compass, gunpowder and printing and making other discoveries far

in advance of the rest of the world, while the Great Wall which they were building still remains, in the second half of the twentieth century, the largest work erected by man on this planet.

Very early in recorded history, India's craftsmen developed a variety of marvellous skills. Ancient Rome was a market for Indian fabrics so delicate that it was said they were invisible when moistened and laid on the ground. Across the Atlantic, the Aztecs of Central America evolved a calendar which has been called more accurate than our own. The precursors of the Incas in the high Andes built walls of huge dressed stones, so skillfully laid without cement that, after nearly twenty centuries, it is impossible to insert a knifeblade between them. Later the Incas themselves constructed a road system along the high Andes, many hundreds of miles in length, which is still one of the engineering marvels of the world.

Not one of these astonishing cultures produced what we understand as an industrial revolution. From the time of the Greeks, some of the finest products of China and India found their way to Western markets but, unlike our machine civilization, the cultures which found such perfect expression in them exercised little influence on other peoples.

The Arabs, during a relatively brief but brilliant flowering, bequeathed to Europe much of the inherited science of Ancient Greece and made fundamental contributions of their own in the fields of chemistry (an Arabic word) and mathematics. The figures now used in calculation by Western scientists, financiers and village schoolchildren were brought to Europe from India by Arab mathematicians, and displaced the clumsy Roman numerals.

No one can say with confidence why the impulse of Arab science and learning withered, for we are here dealing with the little understood problems of the rise and fall of civilizations. What is certain is that the spirit of inquiry and experiment first fostered by the Ionian Greeks later passed, by way of the Arabs, to various European peoples, and that the birth of the "modern" technological world was entirely a European phenomenon.

It looks as if the world is now entering upon a phase in which non-Western peoples are about to be drawn once more into the field of scientific and engineering progress.



© Almasy

ENGINEERS FOR INDIA. India boasts one of the most modern institutes of technology in Asia with the recent completion of the Indian Institute of Technology in Bombay shown here. Established with the help of U. N. Technical Assistance funds, the institute can accommodate up to 2,000 students. Nine hundred students and 150 trainees are already taking courses. Unesco has spent since 1955 nearly \$1 million on specialists, \$3 million to provide scientific equipment and \$200,000 for scholarships. Nineteen Unesco specialists are working on the staff. The institute will be officially inaugurated later this year.

With the great stress now being laid upon the training of research workers and engineers and the vast increase in the pool of human talent which the spread of education will open up outside the Western world, it is tempting to speculate on the immense advances which the next hundred years may witness.

As the impulse of the Moslem thinkers waned, a deep stirring began in eleventh and twelfth-century Europe. New ideas, new ways of thought and possibilities of living continued to present themselves, until the life of the Western European peoples was affected in all spheres, from the conditions on which a tenant farmer held his acres to the technique of portrait painting.

Then, in the fifteenth-century—and still more in the sixteenth—came the great explosion. Henry the Navigator began the patronage of seafarers which was to lead to Columbus, Vasco de Gama, Magellan and the new maps of an unsuspected world. Giotto had shown the way, but now came Leonardo da Vinci and Michelangelo. The rare personal touches which a mediæval memoir writer allowed himself blossom into the ironic self-exploration of *Le Montaigne*. Cervantes writes the first great novel of Europe, though not of the world, and Shakespeare gathers up in himself the resources of an age, and of every age. Bacon and Descartes lay the foundation of modern thought. Rembrandt for the first time puts all experience into the lights and shadows of an aging face.

Nothing quite like this was happening in the other

cultures of the world. Europe's intellectual and spiritual experiments at this time were associated with changes in Western man's relation to his fellow citizens, in which economic elements played an important part. Especially in England, society was moving from a static condition centred on the country gentleman into a dynamic phase in which the merchant was working—and working with grim persistence—toward supremacy. The great explorers of the fifteenth and sixteenth centuries were advance guards of commerce. Columbus won support, and sailed, because he believed that he could open a more profitable route for trade with India.

One immediate result of the discovery of the New World was a flow of gold and silver into the treasuries of Europe. Economic historians have shown how this new supply of the precious metals released fresh energies in many departments of European life. It did more than help to finance new merchant ventures and to pay for more goods offered for sale. It led to the endowment of numerous public institutions such as schools, which opened the doors of learning and opportunity to many, and so helped to cultivate the resources of Europe's most gifted minds. Shakespeare's grammar school at Stratford-on-Avon was endowed in this way about a century before his time.

There is reason to think that a good many inventors in 29

CONT'D ON NEXT PAGE

Revolutions in farming & industry

medieval Europe may have worked secretly and kept their discoveries to themselves, for fear of persecution as wizards. With the dawn of the "modern world" new discoveries of all kinds became fashionable and rewards were attached to those that had money-making possibilities.

By the eighteenth century, even provincial clergymen in England were inventing new appliances for the spinning and weaving which were so prominent in the early stages of the industrial revolution. Such inventions held the promise of bigger profits for mill owners and merchants, and this was the best way to secure a hearing in a world where manufacturers and investors of capital were coming rapidly to the fore.

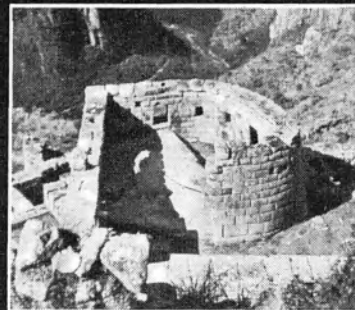
In seeking an explanation for the rapid growth of the factory system in England around 1800, we shall find no more important cause than the rise, over the previous five centuries, of an enterprising and increasingly prosperous commercial class. These new merchants or businessmen began to emerge with the shift from subsistence agriculture to an economy of exchange. They formed a new middle class with certain very distinct qualities. Work for its own sake gradually became a fetish, and thrift, leading to a steady accumulation of capital, was regarded as an essential part of the good life. The English diarist Samuel Pepys, writing in the 1660's, continually dwells on his growing capital. He could not know that he was the unacknowledged mouthpiece of a new age.

THE industrial revolution in England found ready to hand rich natural resources like coal and iron, a large merchant class eager to seize the new opportunities for profit, ample capital to pay for the new factories and machines and an abundant supply of very cheap labour, consisting largely of women and children uprooted from the countryside and almost unprotected by the law.

New inventions placed at the disposal of the merchant class provided railway and steamship facilities for the rapid transportation of raw materials to their factories, and of manufactured goods to their customers. The Royal Navy guaranteed their safe passage and Lloyd's insured them against loss.

In spite of all these advantages, the English industrial revolution could hardly have succeeded unless a revolution in agriculture had taken place first. This agricultural revolution in Western Europe, led to the growing of more wheat through enclosure of common land, to the rotation of crops, to the winter feeding of cattle and to other improvements in efficiency. It was less spectacular than what happened soon afterwards in the factories, and it is much less vivid in our minds. Yet the two movements were intimately connected.

Before any large-scale economic development can take place in an underdeveloped country, the output and efficiency of its agriculture must be increased. The growing populations of the cities and industrial areas must be fed, because they are not self-supporting, as are the villagers. The country-dwellers must also be able to produce more food in order to earn higher incomes by selling surplus produce, or they will be unable to buy goods from the factories, and the industrialists will be without an essential market. It was fortunate for the nineteenth-century England that these technical changes on the farms had largely taken place by the time the first factories were being built.



ENGINEERING

The Spanish Conquistadores who arrived in Peru in the 16th century found a civilization already highly advanced. The empire of the Incas had an extensive network of well-built roads, a remarkable irrigation system. Using stones of considerable weight, Inca engineers perfected an amazing method of building construction, but were ignorant of the wheel.

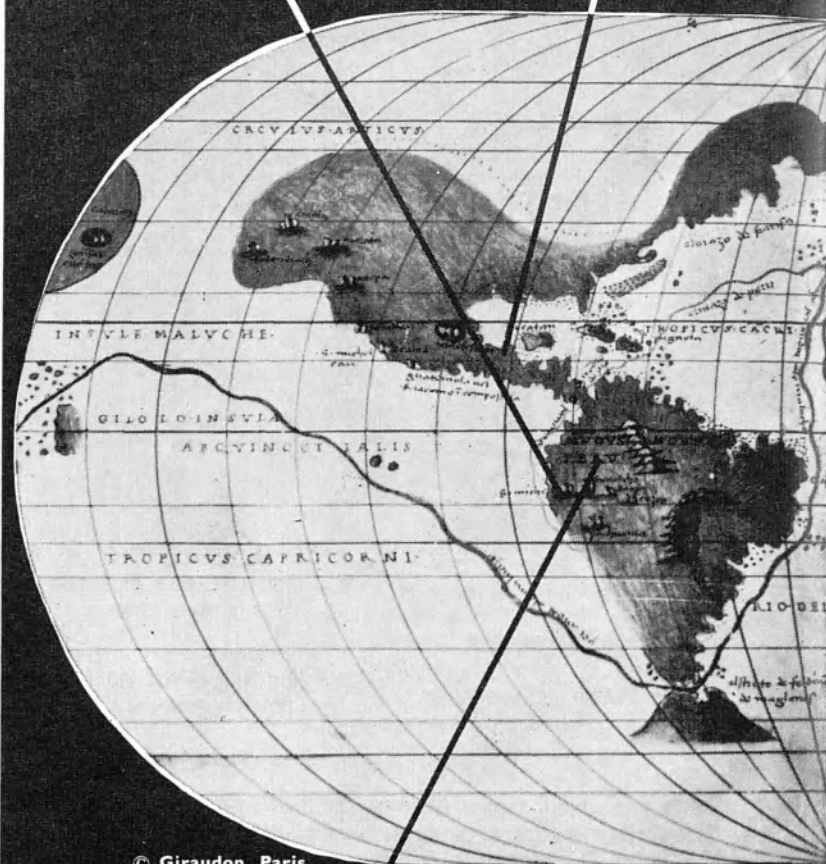
© Verger

ASTRONOMY

The ancient Mayas, in the first centuries of our era, were highly skilled astronomers. Through their celestial observations and mathematical calculations they worked out a complex calendar which is considered more exact than the present-day Gregorian one.



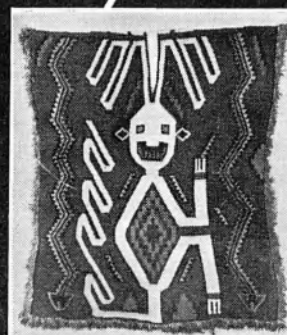
Buffalo Museum of Science



© Giraudon, Paris



"A History of Technology" Oxford University Press



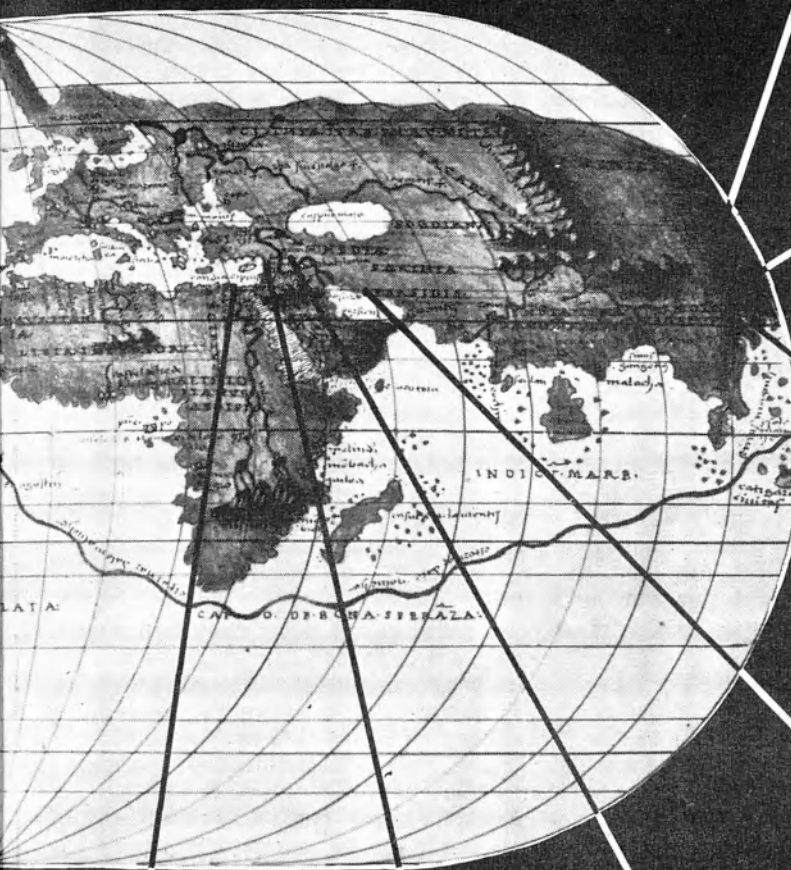
WEAVING

More than 4,000 years ago in Peru cotton was grown and woven into such striking patterns as that of this poncho from Narca (opposite). Cotton was not raised until the year 500 B.C. in the Nile Valley. Early Egyptians cultivated and spun only linen and hemp.

Collection Cleveland Museum of Art

WORLD PIONEERS OF TECHNOLOGY

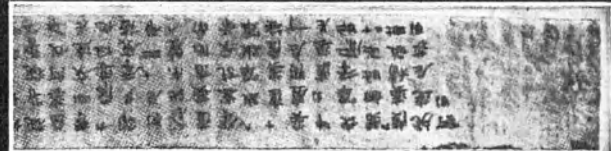
This 16th century map of the voyages of Magellan shows only a few of the vital contributions which many of the so-called "underdeveloped" countries have made in the past to the technological and scientific development of today's industrialized society.



THE COMPASS

It was largely thanks to the compass that Portuguese and Spanish explorers found distant lands in the 15th century. But Chinese sailors were the first to navigate with a magnetic needle in the 7th century.

© Bulloz, Paris



INIAG, Paris

PRINTING

The oldest known printed document dates from the 8th century in China. Chinese paper was first manufactured in 105 A.D. Printed impressions were made from engraved plates until 1041 when, centuries before Gutenberg, the Chinese Pi-Chang invented the first movable type.



MEDICINE

The world's first medical treatise dates back to 2700 B.C. under the Chinese Emperor Chen-Nong (opposite). Some thousand years later the Babylonian King Hammurabi decreed a series of laws governing the practice of medicine and surgery. By the year 500 Indian scholars had identified 700 medicinal herbs.

"La Médecine chinoise," Ed. Dacosta, Paris

SHIPBUILDING

Egyptian sailboats cruised the Mediterranean in 1500 B.C. Under Rameses II Egyptian sailors voyaged by canal from the Nile to the Red Sea. Sizeable naval squadrons from Egypt penetrated the Indian Ocean in 1200 B.C., probably as far as Sumatra, in ships 220 feet long with large crews.

"A History of Technology"
Oxford University Press



METALLURGY

Mining of copper, silver, and gold and the making of glass was current in Mesopotamia and Egypt 6,000 years ago. Iron was not discovered until 1,000 years later in the same countries. Above, an iron axe decorated with copper and gold (1300 B.C.) found at Ras Shamra in Syria.

MATHEMATICS

Mathematics owes much to the Orient. The formula of Pythagoras' theory is found on Mesopotamian clay tablets dating back to 1770 B.C. In 400 A.D. India produced one of the early mathematical treatises, the "Surya Siddhanta," and during this period gave the world its first recorded works on algebra.



Yale University



WRITING

Three thousand years before Christ the Sumerians had an alphabet of 500 to 600 characters one hundred of which were phonetic. Tablet-writing in Mesopotamia (opposite) progressed steadily to cuneiform letters. By 1300 B.C. the library of the Hittite capital, Hattusa, held texts in 8 tongues.

Oriental Institute, Chicago

Can ancient values survive a machine age?

But even the agricultural revolution at home would not have sufficed to feed the rapidly growing population, which was concentrating more and more on work that did not produce food. Just at this moment, another fortunate circumstance came to the help of the manufacturers and businessmen. Broad farmlands were being opened up in North America, Argentina, Australia and New Zealand from which ample supplies of wheat, meat and dairy produce were to flow to the crowded cities of the United Kingdom in return for her eagerly desired manufactures.

The historian cannot explain why European thought took the direction it did at the dawn of "modern" times or precisely why the industrial revolution occurred just when it did and how it did. Nevertheless, he has no difficulty in pointing out the contributing factors at which we have glanced, factors that help to explain why progress was so rapid. When we turn to the problem of economic development in our contemporary world, it is obvious that conditions differ in many important respects from those we have been considering.

Many of the underdeveloped countries of today do not possess the raw materials required for industrialization. Still more important, few of them have undergone the long preliminary period of social change which took place in England before the industrial revolution began there. In particular, most of these underdeveloped countries have never seen the emergence of a powerful mercantile class with the enterprise, the experience and the accumulated capital, as well as the broad international connexions, which the businessmen enjoyed in England, the centre of a world-wide empire.

In some of today's underdeveloped countries, the small educated class has tended to despise commercial and industrial pursuits, while lack of education and capital has prevented the mass of people from using trade as a means of substantially improving their condition.

Perhaps most fundamental of all is the different philosophy of life obtaining in many of today's underdeveloped countries. The success of Western technological civilization has depended upon the willingness of large numbers of men persistently to devote their energies to the acquiring of material goods and social prestige symbols. The habits of industry, thrift, accumulation of capital and shrewdness in the far-sighted employment of it opened the doors of society, while earning the plaudits of moralists. As the twentieth century advanced, the desire for possessions and security has been intensively stimulated, lower and lower down the social scale, by all the resources of professional advertising.

It would be a mistake to suppose that, even in the West, man has always been eager to make this effort. In fact, lack of discipline and absenteeism were among the most serious obstacles to economic progress in the early factory age. A contemporary observer, Andrew Ure, in his *Philosophy of Manufacture* (1835) remarked: "The main difficulty of the new industrial system did not, to my apprehension, lie so much in the invention of a proper self-acting mechanism...as in training human beings to renounce their desultory habits of work and to identify themselves with the unvarying regularity of the complex automaton... Even at the present day, when the system is perfectly organized and its labour lightened to the utmost, it is found nearly impossible to convert persons past the age of puberty, whether drawn from rural or from handcraft occupations, into useful factory hands."

32 Long ago, Aristotle said in the *Nicomachean Ethics*: "We busy ourselves in order that we may have leisure" and it has been pointed out that the Greek language has only a negative word for "job" or "business"—*aszolia*,

literally "the lack of leisure." The Latin equivalent for "business" is *neg-otium* or "absence of leisure." The German for work—*arbeit*—comes from a Middle High German word, *arebeit*, which had the meaning of "hardship" or "distress."

We have contemporary evidence to show that it took much effort and not a little brutality to create in the early factory workers the habits of unremitting attention and regularity that machinery demands, habits which, in the fields and the artisan's shop, can be less rigid and exacting, thanks to the relief afforded by varying tasks, seasonal changes, weather conditions, traditional religious festivals and folk ceremonies.

If the discipline of industry took a long time to assert itself in the West, obstacles of a still deeper nature may hinder its development elsewhere. Compare the outlook which is now typical of many Western societies with the traditional attitudes of a civilization like that of India.

There, renunciation and the conquest of desire are principles deeply admired. Matter is the great illusion and desire the root of all evil, a force which draws man into a material world with which his real self can have no affinity, and to which his genuine interests would never bind him. From the standpoint of this ancient culture, the stimulation of material desires and the creation of means to satisfy those desires are in the highest degree vanity and foolishness.

HERE are, of course, many underdeveloped countries in which these views are not held, or are restricted to certain spiritual teachers and their disciples. Few Indians would today see an irreconcilable conflict between the Hindu religion and an effort to improve standards of living. The existence in non-industrial societies of such traditional attitudes before the great mystery of life and a widespread reluctance to submit for long to the monotony of industrial labour should however be noted.

Critics of the West have pointed out what they believe to be a certain selfishness and superficiality in the attitudes which have made Western industrial civilization possible. They see in Western man a desire to "have" rather than to "be," and they compare this unfavourably with the more communal, less individualistic and acquisitive state of mind that prevails in much of Asia and Africa. There, at least in many rural communities, personal aggrandizement tends to be condemned as a motive for human conduct. Sharing with one's fellows is taken more readily for granted and time is something to be enjoyed, rather than used, like a song by firelight that enriches companionship, even if it leaves the coffers as empty as ever. Such attitudes could perhaps restore to the "acquisitive society" a dimension of human warmth which it has, to some extent, lost. In any event, they cannot be overlooked if we seek to compare the mentality of today's underdeveloped countries with that of industrial England or America.

In the attempt to move from an earlier, rural culture into the mobile, machine-conscious, urbanized, technological society, the "less developed" countries may risk losing precious social values consecrated by tradition and also art forms which satisfy aesthetically as manufactured goods can never do. Only economic development and industrialization can reduce the material sufferings and insecurity of the less privileged peoples, but respect for these social and artistic values may still be a guiding principle both of those who are seeking to diversify their economies and of the experts from industrialized countries who go among them, sometimes without fully realizing what treasures an "underdeveloped" culture may conceal.

(To be continued.)

Letters to the Editor

SPECIAL ISSUES

Vs. VARIED ISSUES

Sir,

As you have asked for readers' views on a single or multi-subject policy for your magazine here are mine.

Being partial to a full and adequate treatment of subjects, I naturally prefer by far the one-theme issues of which you have already given us some magnificent examples. Scientific discoveries, artistic treasures and literary masterpieces are not too numerous to prevent your making individual mention of each of their authors and of presenting in a single issue their lives, the history of their works and, above all, the objective and competent judgment of their contemporaries.

Marcel Faelli
Dampremy, Belgium

Sir,

I agree with your correspondent Tom Kloeping (Sept. issue) that THE UNESCO COURIER has lost some of its unique flavour and carries less weight since it ceased to concentrate on the various aspects of one special subject.

Ellen Bosanquet
Falmouth, England

Sir,

It would be a pity if you ceased to publish issues devoted to one theme. These are the numbers of THE UNESCO COURIER that I treasure the most.

Paulette Vassel
Suresnes, France

Sir,

You are making a big mistake when you devote your magazine to a single subject and adopt a dry and official style of presentation. This could make the subjects dealt with more difficult to understand and act as a brake on the expansion of your publication.

P. F. Oloviaguine
Shardjou, U.S.S.R.

Sir,

I prefer *greatly* whole issues devoted to one theme: it makes the issue more authoritative and worth keeping for reference. The UNESCO COURIER in its old form was in an outstanding class of its own and I was always recommending it to friends and to educational institutions.

Cyril Harrison
Birmingham, England

EDUCATIONAL

BUT NOT BORING

Sir,

As a fifteen-year-old schoolgirl, I first came into contact with THE UNESCO COURIER when I wrote to the Foreign Office for information about the Aswan Dam. This was for a

school competition project which I had entered.

The Foreign Office sent me an issue of THE UNESCO COURIER, partially devoted to Abu Simbel. With its aid I won the project, and decided to subscribe to the magazine.

Since that time I have been entirely satisfied with the articles, which I find to my delight vary widely. I feel that, although I hope to continue on to further education on the side of the arts, my education could not be complete without some knowledge of science, people, ancient civilizations etc. which the magazine deals with admirably.

I wish that other people of my own age group knew about it. It is educational, without being boring, unlike so many textbooks.

Deborah Parker
Wirral, England

NEW WAYS IN ASIAN MUSIC

Sir,

I agree wholeheartedly with Alain Daniélou "Music of the Orient", June 1962 issue, that international music education is a worthwhile step towards the understanding of other cultures and that this is best accomplished today by means of recordings and radio. I must however take exception to several of his statements.

Music is a form about which we are all most subjective but, who can say that "new forms and innovations in Asian music destroy the meaning"? Should we not think of them as additions rather than destructions? A new face doesn't mean that the heart is gone.

As a student of the instrument pictured in the hands of Ravi Shankar I feel that some mistake must have been made in the captioning. Though it is true that India's stringed instruments have been lumped together as "vinas", the instrument shown is best known throughout the world as the "sitar". It is indeed difficult to describe these instruments because of the wide variation in each type but a careful look at the photograph will show that this one has twenty frets, seven main strings and thirteen sympathetic resonating strings on a fingerboard of teakwood.

P. Estabrook
Bombay, India

Ed. note: Professor Daniélou (who did not write our captions) says:

"The instrument is an Indian Sitar. It has four main strings, two or three drone strings, and 13 sympathetic strings tuned to the various notes of the mode and that help to increase the resonance of the instrument. These cannot be called drone strings. The number of frets is usually 20.

On the photograph of an Indian painting next to that of Ravi Shankar, the instrument is an Iranian selitar (not an Indian instrument). The musician may be Persian or Indian."

LITERACY IN SWITZERLAND

Sir,

The use of statistics is always somewhat questionable as one never knows how the figures have been arrived at. New evidence of this is given in the pages of your June 1962 issue where we read how illiteracy has been rapidly reduced [to 3.5%] in Cuba under Castro, and you then place Cuba's illiteracy on a par with Switzerland and other countries. On this basis, Switzerland would have 20,000 illiterates which is certainly far from the truth.

Franz Köller
Benken, Switzerland.

Ed. note: Our reader is correct. Illiteracy is practically non-existent in Switzerland and cannot be put on the same level as that of Cuba. The parallel with Switzerland was drawn by the Cuban Ministry of Education in a report communicated to Unesco which indicated that Cuba's illiteracy percentage was 3.5%.

HAZARDS OF SPACE DISEASE

Sir,

Anent the letter from Mr. George R. Schäfer in your May issue. Speaking of the two-way problem of disease-causing agents in space ventures, and perhaps of interest in connexion with your forthcoming special issue on the Conquest of Outer Space, note is made of the fact that two years ago I published a short item in the American journal "Science" [vol. 132, p. 1569 (1960)] stating that it was time to begin investigations into the production of germ-free humans.

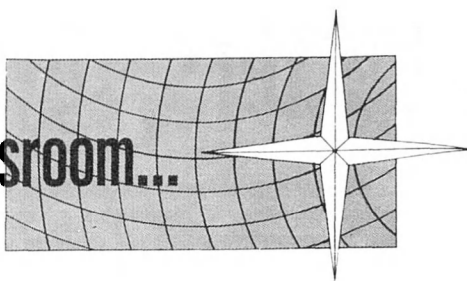
Of course, it would be out of the question to take a human infant and raise it germ-free; however, the notion seems entirely feasible for adults who have developed a full complement of anti-body and other defense mechanisms, so that they could be returned to their natural environment with a minimum of danger.

As for "space disease" brought back to earth, it appears that an important gap will have to be filled. Namely, the gathering of extra-terrestrial infectious agents (which in all probability exist) by specially-designed, unmanned vehicles, and bringing these back to earth for "space bacteriology" and like examinations having the aim of developing or using present disease countermeasures.

It is not inconceivable that "space disease" could provide a major hazard for manned expeditions.

Jack DeMent
Portland, Oregon, U.S.A.

From the Unesco Newsroom...



INTERNATIONAL TV BY TELSTAR:

For the first time, on September 17, an intercontinental TV programme was transmitted by the communications satellite Telstar. It was a U.N. programme, honouring the memory of Dag Hammarskjold, former U.N. Secretary-General, Count Folke Bernadotte, U.N. Mediator for Palestine and others who died in the cause of peace, and was seen by audiences on both sides of the Atlantic. It included ceremonies at U.N. Headquarters, New York, Unesco Headquarters in Paris and at Dag Hammarskjold's tomb in Uppsala, Sweden.

RENE MAHEU CANDIDATE FOR DIRECTOR-GENERALSHIP:

The Executive Board of UNESCO, after meeting in Istanbul in September, announced its decision to submit for the approval by the General Conference of the Organization which opens in Paris on November 9, the nomination of Mr. René Maheu, Acting Director-General, to the post of Director-General of UNESCO.

GIFT COUPONS HELP UNRWA:

Over \$170,000 to aid UNRWA Arab Refugee Camps and Schools (See THE UNESCO COURIER, October 1962) has been raised in the past ten years by schools, organizations and individuals in twelve countries and donated through UNESCO Gift Coupon Scheme projects. This aid came from Australia, Belgium, Canada, Denmark, France, Germany, Italy, the Netherlands, Norway, Sweden, the United Kingdom and the U.S.A. Unesco's current project (GCP N° 324) invites contributions for provision of science teaching equipment, domestic science materials, school libraries and youth centres.

HONEY IN THE DESERT:

Experiments have now shown that bees can live happily, busily, and profitably in the Kara Kum and Kizyl Kum deserts of Uzbekistan U.S.S.R. thanks to the thorn and wild desert grasses which blossom in summer. Many collective farms are now setting up apiaries in these areas, but to protect busy bees from heat prostration, their hives must be set up under tents which are kept sprinkled with water.

SAVING THE ORYX:

An expedition recently set out for the Rub al Khali desert of southern Arabia in search of spec-

imens of the Arabian oryx, a rare, long-horned species of antelope which man has almost succeeded in wiping out. In the past there were large numbers in the Middle East, but they have been progressively hunted down. An aerial survey earlier this year revealed only seven specimens surviving. The Fauna Preservation Society in London with the support of the World Wildlife Fund sent the present expedition to capture the remaining animals and fly them to a place of safety, probably somewhere in Africa.

AGAINST DISCRIMINATION IN EDUCATION:

The U.S.S.R. has become the seventh country to ratify the Convention Against Discrimination which was adopted in 1960 by the UNESCO General Conference. Designed to promote equality and justice in access to education, the Convention defines discrimination as including any distinction "based on race, colour, sex, language, religion, political or other opinion, national or social origin, economic condition or birth."

CULTURAL PASSPORTS:

The Hague Art Foundation in co-operation with the city authorities is now issuing "cultural passports" to young people aged between 15 and 20. These passports provide entry to exhibitions, art galleries and museums and enable the holders to enjoy theatre, music, ballet, opera and film performances at reduced prices.

VOLTAIRE'S LIBRARY:

A detailed description of Voltaire's library, which was purchased by Catherine II of Russia after the death of the great 18th century philosopher, has now been given in a book published by the U.S.S.R. Academy of Sciences. Voltaire's many notes, on the margin of his books, are rich material for research. Especially noteworthy are letters he received from the Russian scientist Mikhail Lomonosov.

WORLD CAMPAIGN AGAINST MALARIA:

Over 90 postal authorities are now taking part in the vast philatelic campaign, "The World United Against Malaria", launched by the World Health Organization last April. Proceeds

from the stamps will be used to advance the WHO campaign to eradicate the disease that threatens 1,300 million people today. Already 764 million people are covered by malaria eradication programmes.

FREEING KNOWLEDGE FOR ALL:

New Zealand and Gabon are the latest countries to join the UNESCO Agreement on the Importation of Educational, Scientific and Cultural Materials which exempts these materials from import duties. So far 39 countries have joined the Agreement which is part of UNESCO's programme to promote "the free flow of ideas by world and image."

SCHOOLS AT SEA:

Over 600 senior boys and girls from secondary schools in France and Britain recently went on a cruise to Morocco, Senegal and Gambia on a ship specially fitted out as a kind of floating school. During their trip they met African youngsters of their own age and joined in many festivities and excursions.

LIBRARIES FOR DEVELOPING LANDS:

To help member states set up libraries which can buttress their educational systems, UNESCO has organized a series of conferences in recent years. Recently it has been participating in three regional seminars organized for the benefit of developing countries: On the development of libraries in Africa (held in Nigeria), of university libraries in Latin America (in Argentina) and on co-operation between libraries and documentation centres in Arab countries (in Cairo).

IN THE STEPS OF ALEXANDER:

A team of German film producers, technicians and actors has recently been following a route taken over 2,000 years ago by Alexander the Great on his way to India, through Macedonia, Turkey, Iran and Afghanistan. The expedition will make a full-length documentary film of Alexander's campaigns for eventual screening on European TV networks.

Flashes...

■ Asia's educational problems are brought home by the situation in India where there are 46 million children of school age—a number equal to the total population of France.

■ Oceanographers are making ever greater use of highly developed fixed buoys (unmanned research vessels) to measure ocean currents and temperatures. Thirty such stations could produce eight million temperature measurements annually.

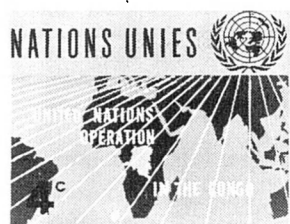
■ Ceylonese fish catches have doubled since 1956, when nylon nets were introduced in Ceylon by a specialist adviser sent by the U.N. Food and Agriculture Organization.

■ Twelve countries (the latest of them being Ghana) have joined the International Computation Centre in Rome set up under UNESCO's auspices.

■ Africa's present cattle population (about 114 million head) could be doubled if trypanosomiasis (sleeping sickness) which is transmitted to man and animals by the tsetse fly in tropical Africa, were eradicated.

■ In the past three years, 1,540 works of fiction totalling 181 million copies have been published in the U.S.S.R. They included books by writers of 68 countries and translations from 45 languages spoken in the U.S.S.R.

THE UNESCO PHILATELIC SERVICE

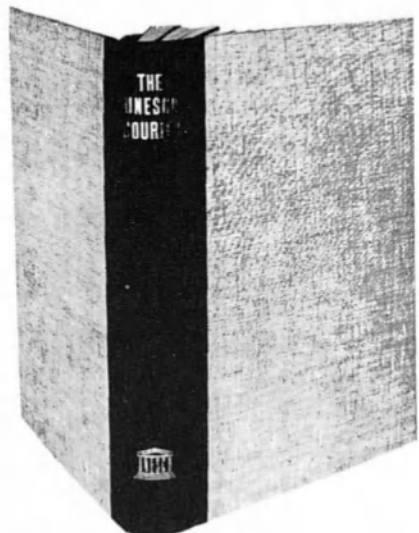


The United Nations has chosen U.N. Day, 1962, on October 24 to commemorate its operation in the Congo with the issue of a new stamp (left). As the agent in France of the U.N. Postal Administration, Unesco's Philatelic Service stocks all the United Nations stamps currently on sale. It also has stamps and first day covers issued by many Unesco member states to commemorate important events in the history of Unesco and the U.N. (Inauguration of Unesco's Headquarters, Human Rights Day, Unesco's 15th Anniversary). Information on items available,

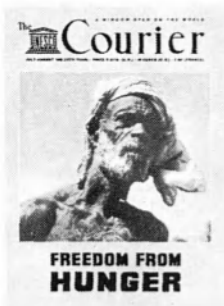
their price and methods of payment will be sent on request by the Unesco Philatelic Service, Place de Fontenay, Paris (7^e).

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MGM

SCIENCE-FICTION AS LITERATURE

This year's Unesco Kalinga Prize for the Popularization of Science has gone to Arthur C. Clarke, a writer who has made his name in science-fiction. In the article on page 14, Mr. Clarke comes to the defence of science-fiction as a new form of literature worthy of attention and stresses the role it has played in arousing interest in science in young minds. Photo here shows a scene from "Forbidden Planet", an American film in which a science-fiction flying saucer sets out from Earth to explore a planet circling the star Altair in the Constellation of the Eagle.