

WORLD ACADEMY OF ART AND SCIENCE

WAAS-Newsletter

No. 10/11

SEPTEMBER—DECEMBER 1969

SPECIAL ISSUE: THE IMMINENT WORLD CRISIS

INFORMATION

to citizens of the United States of America

TRANSNATIONAL FORUM

HUGO BOYKO:	The World Crisis—and Steps to Stop It
GEORG BORGSTROM:	War on Hunger—the Need for a Strategy
MAX HIMMELHEBER:	Cardinal Koenig's Proposal

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1. Volume VI:
STUART MUDD: Foreword to Volume VI (WAAS-Series)
HUSTON SMITH: The Relevance of the Great Religions for the Modern World
Contents of Volume VI
2. JOHN McHALE et al.: World Facts and Trends

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edited by HUGO BOYKO

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INFORMATION

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Transnational Forum

EDITORIAL REMARK:

The contributions to our "Transnational Forum" represent the opinion of the respective authors and not necessarily those of the Editors or of WAAS. They may concur with or may even be in contradiction to it. The only criterion is the subjectively high ethical or scientific level of the article.

The purpose of the "Transnational Forum" is primarily to stimulate, with scientific objectivity, discussion and/or action on vital problems of mankind.

All Fellows and Members are invited to contribute short papers of general interest to the "Transnational Forum" or comments on those articles already published.

HUGO BOYKO:

The World Crisis — and Steps to Stop it

(An Introduction to WAAS-Newsletter No. 10/11)

The World Academy of Art and Science and its World University have been founded to study and discuss the means for solving the vital problems of mankind and to seek ways for their solution. And nothing can be more vital than those problems, the solutions of which open the way to its survival.

All articles of this issue, those published within the framework of the "Transnational Forum" as well as those printed in the rubric "Publications", deal with the one overriding problem: the rapidly approaching world catastrophe and practical steps to stop it.

Looking back one is surprised how slow the attention of the majority of scientists could be drawn to the overall danger, which was recognized about 25 years ago by the initial Founders of WAAS. One has to admit, however, that this recognition is now growing with great acceleration, at least in the scientific world and among certain other groups of the intellectual elite. But, even now, because of the overwhelming magnitude of the threatening catastrophe, it is very difficult to imagine it by most of them, or perhaps by all of us.

The main progress is to be seen in that an evergrowing number is at least recognizing the most important single components of what we have to fight against, as for instance:

Overpopulation, Lack of Food, Water- and Air Pollution, Urbanization and growing Traffic Problems, Encroaching of Deserts (including man-made ones), Radio-active and other accumulating Waste Material, Diminishing Irreplaceable Natural Resources; the many Social and Psychological problems, including the Educational ones, brought about by the great discrepancy between the various existing political structures and the newly evolving needs of mankind as a whole; the discrepancies between the industrialized countries and the developing ones; and so on.

More and more people are now aware, that in this new modern time GLOBAL PLANNING has become a must, and that GLOBAL COOPERATION has to substitute traditional power politics.

The two related Conferences, namely, the Nobel Symposium on "The Place of Value in a World of Facts"* and the forthcoming International Conference on "*Environment and Society in Transition: Scientific Developments: Social Consequences: Policy Implications*"** are proof of the steadily growing attention in the intellectual world to the impending crisis.

With great hope we are particularly looking forward to the last mentioned Conference in April 1970, because in this eleventh hour, after the necessary theoretical discussions, it will be the first time that attempts will be made to outline a strategy, a strategy far transgressing the fields of science.

During the last 20 years or so, scientists may have grown in their influence on political leaders, but even in the best cases, theirs is only a secondary advisory role. In order to obtain the moral and material support of the masses in the fight to stop the approaching world catastrophe the scientists will need the cooperation of those leaders in the political, financial and the spiritual field who are able and unselfishly willing to bring about this support and to arouse the emotion in the masses, which is necessary to obtain sufficient political support.

It is therefore also to be hoped, that this Conference will, to the highest degree, find the collaboration of the World Press, and last but not least, the cooperation and constructive help from our youth.

Only then, namely, by a close cooperation between the leaders in Science and Technology on the one hand, and the political leaders, the religious and other spiritual leaders, as well as the leaders in the financial world, the world press, and the younger generation, on the other hand — can a strategy be found *and* implemented.

* Organized by the Nobel Commission in Stockholm, September 1969 and held in collaboration with the World Academy of Art and Science.

** International Joint Conference of the American Geographical Society and the World Academy of Art and Science to be held in New York from the 27th of April to the 2nd of May 1970.

War on Hunger—The Need for a Strategy

Introduction

A surprising lack of awareness prevails as to the gravity, the magnitude and the nature of the current world crisis. Statistical data about the numbers of hungry, the shortage of resources, and the needs and requirements as to housing, water, and land all swirl around almost daily in mass media and newspapers. Yet, our imagination seems to fail in realising their significance. A world in poverty and misery is out of focus and so badly blurred that it almost constitutes an unreal reality. Yet, this crisis deepens by each day. The situation is very much like what Mark Twain commented about the weather: Everyone talks about progress, development, take-offs, GNP, technical advances, economical miracles, green revolutions, industrialization, but no one seems to dare to state the truth or far less to want to do anything about it. In relative terms there is today even less progress than a decade ago. Statistics speak in this regard an all too clear language.

Unquestionably, there are many good deeds both to admire and register. There are innumerable accomplishments of merit; some with a clear tinge of excellency. There are indisputably many feats in man's quest for a better life. There is further deep concern among many groups for their fellow man, manifested in extensive charity and effective action. Nonetheless the truth is that we have reached almost mastery in rhetoric beautification. Let us, therefore, for a moment rip away the embellishing veils, hiding an ugly reality. Let there be no misunderstanding as to the truth about our failure as a human race.

Failure despite impressive advances

Despite our proficient performances and unprecedented advances in public health, agriculture, fisheries, and technology, resulting in impressive gains in producing more food and fertilizer than ever before, we are nevertheless losing the race, and lagging behind in almost every respect. The backlog of hungry and malnourished now exceeds 2.5 billions. We have failed even to provide adequately for the one billion added since 1948. Only 500 millions enjoy the privilege of water from a faucet, with no less than 2,700 millions being short of water which is acceptable in quality and quantity (WHO-findings.) Even the literacy campaign is slipping. The world is adding 30 more millions each

* Professor GEORG BORGSTROM, is professor of Food Science in the Department of Food Science at the Michigan State University and also Professor of Geography there.

This article is an address held at the World Affairs Institute, San Diego College, San Diego, California, on August 15, 1969.

year to a backlog of 750 million illiterate adults. A persistently growing percentage of the world's children receive no schooling.

Inadequacies

UNICEF, created to feed the malnourished children of the world, never obtained adequate funds, and, as a consequence, at the best, never reached directly more than one-tenth of the world's needy children. There are more than a billion children in the world, around 650 million of which never will reach adulthood, largely due to the direct or indirect effects of malnutrition. Most sick people of the world never see a doctor and still more die without such aid. Despite laudable efforts by WHO more than 900 million people carry life-sapping hookworms. More than 500 million suffer from vision-depriving trachoma, due to eye-infections, sustained by lack of vitamins. Many successful campaigns have been launched against malaria, yet, 250-300 millions suffer from this debilitating disease. Tropical Africa is still saturated with malaria. More money would be needed to launch an effective campaign in Africa against this single disease than what WHO totally has available for the fight against *all* maladies in this disease-ridden continent.

One third of the human race earns less than two dollars per week (\$100 per year) — in most Indian villages $1\frac{1}{4}$ dollars — adding another third of the human family one finds two thirds with a weekly income of less than 4 dollars (\$200 per year). Sixteen percent of the world's population earn 75 percent of the world's income. The ominous Hunger Gap has a counterpart in a still bigger Poverty Gap — also widening all the time and at an increasing rate.

Ever since the social revolutions initiated around the turn of the century the redistribution of wealth to the mutual benefit of the entire society was brought into focus the alternative remedies that emerged were increased production, transfer of resources through taxation, or revolutions. The alleged miracles of Mexico and Japan have not involved the total society. The chief beneficiaries are an emerging middle class of less than ten percent. Averages are on the whole misleading both to experts and to laymen. Boosting average food intake by including the tourist eating or by overlooking top consumption by a privileged minority blurs the true nutritional picture. In many instances, a major fraction of society does not earn the money and as a consequence lacks the resources to purchase the food they need.

Double-talk

Our double standards are evident in a number of additional areas. We place far greater effort into peddling weapons than in marketing and providing food. Military aid has by far superseded constructive agricultural or economic aid.

We talk education and the essentiality of schooling, yet, we do not hesitate

to pick away experts in significant numbers from crucial areas, such as India and Latin America. India provides the United States each year with a number of doctors amounting approximately to the output of three major medical schools. This is, the so called "brain drain" with many more ramifications, not the least the creation, to our own detriment, of vast underdeveloped sectors right in the midst of our affluent world.

Aid loans through the World Bank and other institutions are considerably emaciated by the servicing of earlier loans. In effect, the poor, hungry world is drowning in debts. Currently, close to half the amount of new loans are ear-marked for this purpose. In addition, in several countries the outflow of funds through invested capital exceeds the amounts received through grants and loans.

Land reform has become the most misused word between Rio Grande and the strait of Magellan. Redistribution of agricultural land is trumpeted as a panacea from the skyscrapers of the capitals and strongly advocated in development symposia on university campuses in Europe and the United States. Yet, most developing countries lack land for distribution, with the landless queues larger than ever before and often counted in the millions. The true fact in Latin America is almost the reverse — at least 40 or even 50 million people need to be relocated from their present lands, as "ecologically displaced persons" currently on land that never should have been tilled.

Industrialization has become another verbal panacea with little concern for the well-being of the pressing multitudes of unemployed. This remedy is advocated despite the glaring lack of investment capital, the non-existence of basic resources, such as water, food, metals, etc. In addition, forgetting we are dealing with a world with only one true surplus, that of man, our costly labor saving devices have limited applicability. Few countries, if any, have more than a fraction of the funds required for adequate investment to employ gainfully those youngsters, who each year reach the labor force. A more adequate description of these unfortunate millions would therefore be non-employable as even under the best circumstances no more than a pittance can be employed within a reasonable time period.

We take comfort in rapid changes, but fail to recognise their nature. In the decade 1970-1980, 280 million more will be added to the global labor force, but no less than 226 million of these will belong to the less developed world. This in all likelihood will vastly swell the overcrowded ranks of underemployed and/or non-employable but mostly non-employable millions in this vast hungry poor world. Our proposals in coping with this dilemma fail on most counts. Basically, their effect is far too tardy really to be useful in the mounting crisis and besides in most instances wholly meaningless as remedial measures.

We recommend expanded trade with little attention to the needs and basic interests of the involved countries. Earmarking their soils and extracting their mine or forest resources primarily to fill our own gaps is a highly

questionable approach to their excessive needs. Paying foreign exchange by depleted resources and extended malnutrition is poor economic policy. Entirely new models are called for which recognize health and nutrition as true assets. The human capital of a nation, of a factory, or a business should be equally much entered into the bookkeeping and be part of the balance in the same way as the investment value of machinery and equipment.

We advocate family planning well knowing that rigorous birth control is what is needed. Many more examples could be brought forth to show the growing discrepancy between our words and actions, between what we believe about the world crisis and its true nature and magnitude.

Global Technical Salvation

The simplistic notion that what the world needed most was a little technological oiling here and there, which took shape in the Technical Aid Program of postwar years, was unfortunate. We still are stuck with this outlook reflected in the persistent emphasis on our superior technology, legendary thriftiness, famed ingenuity, unparalleled creativity, and unexcelled way of life. Others are still more articulate and elaborate on the characteristics of that other world; its atrocious backwardness, notorious listlessness, flickering creativity, and imprudent ways of life. Some even have the impunity of dragging religion into this analysis and say that our technical progress is an outflow of the active, positive attitude of life created by Christianity in contrast to the passivity exhibited by a contemplating Buddhism, ascetic Hinduism, and a fatalistic Mohammedanism. There is a little core of truth in all these statements. Nevertheless, they entirely miss far more vital causes of the Hunger Gap.

The Overdeveloped World

Classifying the world on the other side of the Hunger Gap by the all-embracing designation of underdeveloped, and as one single backward world reflects two dangerous fallacies. Key parts of that hungry and malnourished world have borne most of the advanced civilizations prior to ours and now stand out, both as a seriously overpopulated as well as an overdeveloped world. Both China and India carried two to three millennia ago, opulent, highly sophisticated cultures. Furthermore, they pioneered world irrigation and many other technologies, as well as spearheaded much of man's early science as far back as in medieval days.

The truth of the matter is that there is a considerable number of these countries on the other side of the gap in effect which are overpopulated, over-extended in water and soil, in addition extremely poor and thoroughly diseased. Most of our programs, national and international, furthermore, have for far too long failed to see the dimensions of their misery and the frightful rate of deterioration, primarily due to their skyrocketing population.

Several of these alleged underdeveloped countries show evident signs of

overdevelopment such as excessive deforestation, excessive ploughing, and overextended use of water. As a consequence, they are hampered by grave soil erosion, creeping salinization, and serious overgrazing. Some parts of tropical Africa and Latin America have, however, a more recent agricultural history, but, nevertheless, already feel the pinch of exploding numbers. In other words, the nature of the crisis has been misinterpreted.

The Hungry world once rich and opulent but is now hitting the ceiling, with far too little for far too many. Their population pressures are rapidly reaching unbearable and unmanageable proportions. Our civilization with its tremendous wastefulness in water, energy and metals simply cannot be copied on a global scale.

The Diversity

There is far too little recognition of the lack of uniformity within what we arbitrarily call the developing countries also in many other respects. By and large this hungry and malnourished world comprise three major social categories: The indigenous population (1), still in the traditional society of villages (India, Indonesia, Andean region, tropical Africa, etc.); the tradesmen and the emerging middle class (2), and finally the exploding slums, (3). These latter are little aided by conventional industrialization. As mentioned, only a fraction of those entering the labor force of these countries currently gain employment. These are the unfortunate millions squeezed from a countryside with no space left. This rural superpressure of added millions, is clearly mirrored in the fact that most of the world no longer has "farms," only plots (1-2 acres), often further fragmented into sublots. Glib talk about land reforms poorly recognize the fact that the number of landless in most countries can now be counted in the millions and there is no land to distribute. It was recently estimated that one-fourth of the human race now belongs to the disinherited category of "squatters." Dumping these millions without work, without hope in cities, rapidly growing into numbers of 30 to 50 million is in itself an absurdity. Add to this the herculean task of feeding these unhappy rootless without an abode and you have the ingredients of mass epidemics and mass famine. It has been estimated that in the year 2000 around 4 billions of the globe's 6.5 billion people will be classified as urban.

More Evasive Verbalizing

Mankind desperately needs new ways of measuring economic progress. Not to include economic activities such as handicraft, and still more subsistence efforts within the concept of GNP is inconsistent. On the other hand, it seems absurd to measure GNP in number and complexity of space vehicles, or in amount of military hardware (missiles, atom bombs, etc.) being piled up. If this is a gauge of GNP, it certainly does not reflect human prosperity.

To retract like the economists, to the fairylands or dreamlands of "effec-

tive demands" or of "purchasing power" is another grand scale deception. Deserting (or abandoning) the grim realities of needs and unfilled requirements and only to recognize those individuals who are in a position of dangling a dollar — (rubel-or-pound) — note is too easy a way out from the rapidly expanding poorhouse of the world. More than half of the world's population seem to lack the means of buying the minimum amount of food they need. From this viewpoint it is almost an insult for those suffering from serious persistent shortage of food and water to apply the term of "self-sufficiency" whenever available effective demand is filled not recognizing the huge unfilled requirements often vastly bigger than demands. The spectacle is absurd when seriously malnourished countries like Pakistan, India, South Africa, and South Rhodesia report surpluses despite the notorious fact that available food falls far short of needs.

No Single Remedy (or The Complexity)

The 1967 Presidential Report on the World Food Issue made the complexity and urgency of this matter abundantly clear. It also concluded that "world malnutrition and hunger are not capable of defeat at the hands of any one group of specialists alone." Yet we are caught in an immense oversimplification of this issue. There is still a glaring lack of coordination both in national and international endeavors. The grave nature of this Man's crisis is only vaguely recognized even by many professional groups, let alone the broad lack of awareness among the public. Newsmedia and general education have failed on almost all levels to convey a reasonably correct picture of Man's Dilemma.

Mankind lost more than twenty postwar years being almost brain-washed into accepting the naive notion that agriculture and technology could readily provide for the human family and almost in any number. The entire discussion was almost one-dimensional, simply a question of producing more food. Only about five years ago the magnitude of our failure was recognized. We were losing the race between human numbers and food production. Despite magnificent accomplishments and advances both in agriculture and fisheries, and impressive contributions by medicine and technology, more hundred million people were short of food and water than ever before in human history. The discussion then quickly shifted as the population dimension finally became universally acknowledged. Although this was a significant step forward the debate was still dangerously eclipsed. It was certainly not as simple as that. More food/and less people, however, now became the sloganeering.

Nutritional After-effects

It is today recognized that shortage of food affects working capabilities and physical efficiency. Many of the poor world have to operate a whole week on the average intake of one day in the western world. Modern nutritional science has, however, discovered still more crucial relationships. Shortage of

protein in the fetus and in the newly born as well as in the infant induces damages to the brain tissue of a non-reversible nature. Such scars have mental consequences resulting in lethargy and less capability of learning, etc.

The Third Dimension

Let us briefly review some neglected aspects. This hungry world is suffering losses of the harvested crops, food and feed through waste and spoilage, by rodents, insects, and microorganisms of the order 30 to 75 per cent. This adds to the crop losses when growing in the field. Without producing a single ton more of food, hundreds of millions more people could be fed by an improved storage, distribution and other marketing facilities. This third dimension of food has another still more critical aspect, namely, the largely overlooked indispensability of processing in making plant products digestible to man. Milling, toasting, par-boiling, fermentation, etc. are prerequisites to human feeding. Add to this the imperative need of preservation both of animal and plant products to extend availability and to safeguard year-round access to food. The whole area of processing and marketing has been grossly neglected in most aid programs and in technical assistance. These key links have either been taken for granted or simply vanished from consideration.

A Sick World...

Furthermore, the poor, hungry world is by and large, despite our efforts, a thoroughly sick and diseased world. This does not only apply to man himself but in addition to his livestock and crops. Losses through pest (insects and rodents), disease (fungi, bacteria, protozoa, and vira), and parasites (nematodes, tapeworms, hookworms, etc.) are backbreaking; about 25 to 30 per cent prior to harvest and 30 to 50 per cent after harvest. It is food for thought that despite potent chemicals and advanced technical devices even the well fed world is faced with considerable losses. Even our rich world frequently produces more insect protein per crop-acre than milk or meat protein.

Water — the Indispensable

Another neglected dimension is that of water which broadens into the need for appraisal of basic resources on the whole. Water and food are in effect Siamese twins. All water used in growing food and feed is consumptive, i.e., moves back into the Hydrological Cycle of the globe and will only return via precipitation. This applies both to the cropping controlled by man through irrigation as well as to that on "natural" non-irrigated fields. Despite the skyrocketing figures for human domestic use of water and the requirements of modern industry, food devours more than nine tenths of the water account. Daily food of an American requires around 3,500 gallons of water per person a day and this has to be honored. Water available for crops on the globe does not allow such a nutritional standard to more than around a thousand

million people. East Indian food requires 475 gallons; a strict vegetarian may subsist on 350 gallons.

The Water Scandal

These limitations raise very serious questions and place into perspective the inexcusable water scandal of the globe. According to WHO, only 500 of the world's 3500 million enjoy the privilege of water from a faucet. More than 2000 million receive water which is inadequate in quantity and unacceptable in quality. Each year, 500 million fall victims to water-borne diseases. Tens of millions have to walk miles (not uncommonly 3-7) to pick up daily water. Water peddlers service more people than faucets do. No wonder sanitation is fighting a costly, futile and gigantic battle. Fecalism is the characteristic hygienic feature of the malnourished overcrowded world and unquestionably still the prime cause of disruptions in human life, accounting, as indicated earlier, for 900 million with hookworms, 500 million with tapeworms, etc. Intestinal parasites are in other words still a scourge to major portions of the human family.

The Green Revolution

In a similar way we talk about high-yielding strains of wheat and rice, forgetting that their productive capabilities have to be honored with more water, more fertilizers, more spray material, expanded storage and processing, and vastly increased amounts of capital. To this comes the ecological dimension. Only in very few instances do we know how these new strains will stand up in new environments and under the bombardment from the massive forces of insects, fungi, etc.

Most significant is, however, the lacking awareness of nutritional realities. In the Third World Food Survey, FAO established that the globe needed a 270% increase in meat production up to year 2000, but preferably a 50% reduction in grain output. This revealed how far astray mankind had gone by only thinking in terms of tonnage and calories, forgetting the far more fundamental C/N ratio. Twelve percent of the total calories need to be protein (in terms of reference protein complete as to essential amino acids this figure drops to 6.5%). The world has in effect no rice, wheat, or corn eaters. Already empirically it was almost universally accepted that cereals had to be supplemented by pulses or nuts. To pump in even more starch to the already heavenly protein deficient areas of tropical Asia seems less than prudent. Most of the high-yielding strains show little gain in protein but gains in starch, making a less tasty product but also far less nutritious food with a decline of 10-25% in the relative content of protein.

The Historical Perspective

Yet, there are far more fundamental factors. I will limit myself to two: availability of resources and trade exchange. Firstly, the historical setting: the

white man who got hold of the North American prairie received the greatest and richest booty ever gained by any group of men in history. In addition the white man grabbed the entire hemisphere with the rich assets of the pampas in the south. We took the high plateau of tropical Africa and played domino with a whole continent, hunting manpower, to aid in taking care of our overwhelming riches. Furthermore, to the white man fell the huge continent of Australia with its precious satellite New Zealand. For a time we nibbled on Asia, making India, British, and the East Indies, Dutch. This era came to an end after World War II, but the white man still retains much economic power marshalling large parts of their soil's resources to provide for himself. In several instances we are in addition both landowners and middlemen. We not only have larger resources in soil and water than this other world but the current European scene depends on such transoceanic crutches. Only in grain does world trade move in terms of net-flow, from the satisfied to the hungry world. The developed world is therefore basically a poor provider other than to itself. In most other commodities but grain the net flow is from the hungry to the well-fed. European milk production is largely depending on feedgrains and soybeans from the North American prairie but almost equally much on tropical Africa and Latin America and their deliveries of oilseeds and oilseed cakes.

Trade and Aid

This absurdity more than anything else has undermined foreign aid activities. The 19th century concept of industrialized countries has lost its validity in modern days, when knowledge, technical and scientific, is universal and no longer can be monopolized. Climbing prices of capital goods, reflecting how the rich world persistently raises its standard, contrasts with the almost equally persistent drop in commodity prices. This has undermined or hollowed the relative value of foreign exchange and nullified much foreign aid. A five percent drop in commodity prices eats up half the aid contribution.

Most American aid is neither foreign, nor aid. Chief beneficiaries have been its agriculture and its industry. True investments aiding recipient countries constitute less than three percent of the total. Most investments have been made to take care of U.S. national interests or needs, as, e.g., the building of strategic roads, the discovery and exploitation of oilfields, mines, etc. U.S. investments in Canada have as a rule been larger than the total placed in the "developing" world.

Gross Dynamics

The gross dynamics of the food-population issue is rarely ever brought into focus. We talk glibly about medical advances as being so much cheaper to bring about than technical and social improvements, overlooking the very obvious relationship that simple survival in itself renders no population increase. This is only realized by providing sustenance to those which have managed to

survive through medical measures whether these are of a collective or individual nature. Consequently, the population explosion is rooted elsewhere than simply in medicine. All of our endeavors not the least of our successes in producing more food, but equally much the improving of storage and processing, facilitating transportation and distribution, have been influential in this dynamic process. Consequently, we are equally justified in placing the blame for the population explosion on agriculture and food science, irrigation and fertilizer experts, highway and railroad builders as well as in the merchant navies, not the least the oil tankers. They have all contributed to making partners of the human family out of the survivors.

A similar fallacious thinking is frequently encountered in common textbooks in history, in economics, in sociology in particular, when analyzing the European population explosion in the second half of the 19th century. This is mostly attributed to the introduction of waterworks which in one single stroke removed waterborne diseases in particular tyfus from the daily scene. This happened both in North America as well as in Europe. Secondly, it is credited to the mass vaccination against smallpox, and thirdly to milk pasteurization. These advances are basically all of a medical nature and are described as such. They would have been of very little avail if vast new possibilities concurrently had not been opened up for the feeding of these growing numbers of survivors. Therefore, equally important was the introduction of fertilizers, and other advances in modern agriculture boosting the yields of the fields. In similar ways the advances in transportation technology created the possibilities for transoceanic as well as transcontinental transfer of food both conducive to the feeding of many more people. Modern food technology at this time also had its breakthrough, particularly in the areas of refrigeration (in particular the refrigeration compressor) and canning. All of these circumstances materially contributed to sustaining the European population upsurge. But in addition the most significant feature of all: the Europeans stood for the greatest migration in human history, net-wise no less than 70 million people roamed to all corners of the globe. We are now faced with the very evident situation that those extra-ordinary measures then taken almost exclusively to feed overpopulated Europe at the end of the 19th century cannot be duplicated in this century. There are in effect no new lands to which man could migrate. World trade will presumably have to abandon the patterns laid down in those days and be rearranged to meet this new impact of human numbers and provide for these vast, new markets. The hungry, poor world will demand their share of the world riches whether they come from agriculture or fisheries. Outside the limited sphere of grain most agricultural commodities are still moving to the western part of the human family. Only Japan has managed to cut in on that share.

Dangerous Omniscience

A dangerous notion is furthermore prevailing that the United States has

all needed expertise. This is best reflected in the recent Presidential Report on World Food Problems. No findings, opinions, or conclusions by non-American researchers, or experts are registered, or are any research findings by scientists in involved countries reviewed. This gives the American people the false notion that only the United States cares or knows. It, furthermore, conveys a wrong image of the developing countries as being entirely devoid of knowledge, suggestions, and vision. This is not conducive to fruitful cooperation and constructive action nor to the right kind of U.S. involvement by experts, educationalists, or for the marshalling of public support.

The Global Aid Crisis

As this world crisis takes on a more sinister nature the foreign aid programs are shrinking and dwindling not only in the United States, but universally. This global aid crisis appears in one regard to be a healthy sign. After 25 years of almost euphoric rhetorics a moment of truth has arrived as we now encounter an unsettled board-and-lodging-burden of no less than 2.5 billion of the present human race and with an almost unbelievable additional load of one billion people in the next ten years. The discrepancy between talk and action is staggering — yet, mankind is quickly reaching the most important crossroad in history. The road we choose into the future will forever determine mankind's fate.

Reappraisal

A soulsearching reappraisal of our own situation and our once "alleged" solutions is called for. We thought and still think we have the answers. Reality has taught us another lesson. Future historians will note with amazement and no little bewilderment that on the verge of universal famine, the western world tried to put into global operation on the world scene, one of the most wasteful civilizations there ever was — excessive in demands on water, energy, soils, etc. — but most absurdly of all, economizing with regard to only one crucial input, namely that of man, while the only true surplus of the world is human numbers.

The Gap Between Words and Action

The tragedy of our day is perhaps not primarily the Hunger Gap, but rather the growing gap between our words and our actions. There is a zooming inflation in conferences, symposia, meetings, seminars *ad infinitum* in sovereign disregard for the fact that the catastrophe already is here. The hungry billions cannot wait and are not the slightest interested in how many billions some odd professor might think the world could feed nor in the warnings that a more serious analysis might express. The hungry only pay attention to what is done to save them or at any rate to alleviate human sufferings. Neither do they care if the grain bowl reached to them is red, blue, or black.

Need for a Strategy

Our tragedy is basically a failure to formulate our goals and work out a strategy. We have been so impressed by the marvels of our means and techniques that we have naively opined that willing the means we should reach the goal of banishing hunger and poverty. We have been masterful at tactical maneuverings but failed miserably as strategists. A crash program is called for. In food terms this means moving from the prevailing simplistic notion that producing more food (1) or limiting human numbers (2), in themselves both important and indispensable activities, is all that is needed but yet this is wholly inadequate to regain control of man's destiny. It took mankind a quarter of a century to move from the one-dimensional thinking prevailing in post-war days that all that we needed was more food. This was precious time lost and we can ill afford to lose another quarter of a century this time by getting stuck in a two-dimensional world. The paradox is that global endeavors are equally much needed as to fighting waste and spoilage, recognizing nutritional needs, staving off parasites and diseases, processing and marketing of foods, appraisal of available soil and water resources, etc. So far no valid remedy has been formulated for the millions currently being dumped in cities with no gainful employment in sight.

Coordination — Prime Concern

Then a final comment: Let us decide, once and for all, to put a stop to the foolish labeling in pessimists and optimists. This is merely a question of mood. When a house is on fire the optimist says: "The fire will soon come to an end," or opines that "it can easily be contained." The pessimist says: "That fire is dangerous and might destroy the house." The realist, however, takes the attitude: "Let us put out the fire and mobilize all our resources to this aim." He does not waste time on passing futile judgements. A message of concern is in effect a true message of hope.

Once again, let us use the metaphor of fire. When the house is on fire it is not the time to study the nature of the flames or the characteristics of combustion, the only thing that really counts is how to put out the fire.

Outline of a Strategy

What is then needed? What kind of strategy? It is not within the capability of an individual researcher to outline a complete battle plan. As in all strategic planning we may need alternative options. Some irrevocable elements will, however, be presented. First, a great number of expert groups hitherto bypassed or only occasionally consulted need to be brought into this strategic planning. They are presently only operating on the fringes, such as entomologists, phytopathologists, ecologists, geographers, food scientists, marketing experts, etc.

(1) Some 10 to 20 emergency task forces, picked among experts around

the globe should be created to tackle crucial areas and formulate valid and realistic programs. Gadgets and toys are poor substitutes in a world of stark realities.

(2) Altogether some one to two million development extension agents need to be quickly trained in the respective regions.

(3) Mass media need to be mobilized to convey information in depth about the crisis, its true nature and actual magnitude.

(4) A coordination of the operational activities of all the specialized agencies of the United Nations is long overdue.

Mankind needs a strategy — a kind of New Deal. The Grand War for human survival is imminent, and for this purpose we will need to mobilize *all* available resources. A radical switch will furthermore be required in our priorities.

Despair and impotence easily becomes the feeling among those that realize the urgency and the imperative nature of the world's crisis. Such an attitude invites still greater disasters. Mankind's greatest moment may still lie ahead if we replace the current lethargy of complacency with the courage of frantic determination. Only then will man and civilization prevail. No young generation was ever faced with a more exciting challenge, but foremost the call goes to the experts in international matters with an urgent plea to bridge the frightful veracity gap, i.e., the staggering discrepancy between the world *as it is* and *as we believe it is*. We food scientists need your full cooperation in fighting the notorious fallacies surrounding this issue and in formulating viable programs for man's future. It is amazing to see how world politics for a quarter of a century has talked around the hunger and poverty issue but with only sporadic efforts to address itself to its realities.

New World Order

Finally let me add what I think is a pertinent observation. The prevailing ideologies whether they are called capitalism, marxism, liberalism, socialism, or communism offer little substance to the all-embracing question of an international order. The communist phraseology of world revolution or the capitalistic belief: "The world is our field" offer little solace to those looking for the framework of a functioning one world, to the benefit of all mankind. Irrespective of philosophies, all ideologies appear to assume that interstate relations will solve themselves and that world trade will run on its own account, ruled by some mystical automatic forces with little rational and in sovereign disregard for all mankind's true needs. No current ideologies are designed to create a functioning international economy nor has there ever been outlined a decent political system for a world state — yet, man is now at the crucial crossroads. He is now faced with having to move out into *One World*, requiring its drastic remodeling. These crucial questions of a new international order need to be removed from the twilight zone of our thinking and be given the prime attention that their urgency demands.

Cardinal Koenig's Proposal

OF JULY 1, 1968:

*The Philosophical and Historical Significance and the Possibilities
of its Realization*

Summary

While the suggestions and ideas of most of today's "admonishers", who worry about the world's course towards catastrophe, culminate in the notion that in the first place, world peace, world government, disarmament and common-sense-conditioned instead of unrealistic ideas and actions of governments and nations must be attained, before the catastrophe can decisively be averted — the offer of Cardinal Koenig presents the possibility for starting immediately with effective measures which, in spite of the world's division into national states and power blocs, can be set up without delay on a supra-national basis.

Admittedly, it would be necessary that the Churches and religious communities took a resolute step towards "secularization", and the community of natural scientists towards "clericalization", i.e. a reciprocally pledged and committed attitude and the from there ensuing consistent action.

A few very different research fields out of the multitude of others are shortly dealt with as examples for action and also to show the complexity and interwovenness of all. The examples refer to the World Food Problem, the World Energy Problem, Garbage Disposal, Development Aid, Organization of a Global Economy, Landscape Planning, and the School Problem.

At the Conference of Nobel Laureates in Physics in Lindau July, 1968, Cardinal Koenig, Archbishop of Vienna, proposed that the "Republic of Natural Scientists" should investigate whether religion and natural sciences could co-operate jointly in assuming responsibility for world pacification.

A year has since passed and — with the exception of certain overtones of scepticism and rejection in a few reports — there has been no answer on

* MAX HIMMELHEBER, Philosopher and Engineer, combines these two widely separate fields into one harmonic accord. Led by his broad and manysided knowledge to the technological possibilities, he presents here a clear picture of the path mankind has approached and why the proposal of Cardinal Koenig has to be carried out in order to enable science, with the help of the people, to avert the world catastrophe.

Max Himmelheber's group includes an elite of German scientists and philosophers like Professors Fisher, Ficht, Schaefer and others who are now preparing a Proposal for practical steps to be presented at the Conference on "Environment and Society in Transition" in New York (April 1970).

the part of the natural scientists. The following pages attempt to show that such a cooperation is possible, notwithstanding the presence of undeniable and deep-reaching spiritual differences.

The major part of the following expose concerns an analysis of the world situation and a few examples of the tasks arising from it. Only a small part deals with the practical realization of the proposed cooperation. This is due to the fact that only a deeper understanding of the complete situation can establish the basis on which each individual can decide whether and how to contribute to the plan, shown in these pages.

Awakening to Planetary Consciousness

Since Christmas 1968, for the first time, pictures of our planet Earth are seen by all of us as a luminous globe floating in black space. Sometimes we even look at our Earth from another heavenly body, such as the moon, with its own wasteland in the foreground.

No doubt these pictures affect men's consciousness and, even to a greater extent, his subconsciousness. In the long run these pictures will change man's attitude towards the universe to no less a degree than Copernicus' theories did in his time. But while Copernicus' insights forced man to abandon the safety of his position and condemned him to the awareness that he and his home planet are merely one of an infinity of motes of dust, these new pictures will make man's consciousness reverse itself again. We cannot go back to the astronomical centre of the world; but the sight of this blue oasis, our own globe, in the midst of an infinity that is hostile to life and full of deadly radiation, in the black void of space, will convey a new awareness of security, of our inconceivable preferential position in the universe, and — inevitable — of the unity of all that is and occurs on our oasis.

By this, we also achieve an awareness of our planetary events as a universal process, i.e., a totality of life on earth, and in the narrower sense, of human existence.

The Global Perils

The movement of mankind's development has now entered a state which may be compared to the dynamics of the free fall.

We may extrapolate the end-position of this fall from a wide range of positions, and will always arrive at the same result: the question is one of the survival of mankind, or of its — probably total — annihilation within no longer than 80 years at most. The reason for this conclusion is to be found in the presence of global perils, each single one of which contains a germ of mankind's annihilation.

A list of these dangers is enumerated below (this list is incomplete, and some of the listed dangers coincide in part or involve different aspects of the same question) :

1) Thinking in terms of progress, as the moving force of scientific and technical development, or the belief in the qualitative progress of mankind through quantitative, non-valuative science.

2) Thinking in terms of national power, as the moving force behind politics.

3) Thinking in terms of profit, as the moving force of the economy.

4) The exhaustion of natural resources as the basis of our technical civilization.

5) The unreasonable involvement of scientists, statesmen and economists in tasks which seem extremely unrealistic in view of the global dangers.

6) The breaking up of man's originally sane and healthy balance of his totality, of the unity of his creative action and his contemplation, into an existence of much lower value when he becomes completely enslaved in the hum-drum of his everyday's activities or troubles forced on him by his present social and economic environment, intensified by the perverse consumption of information or more often misinformation by the masses.

These perverted basic attitudes result in acute global dangers which only a few decades ago could not even be conceived as theoretical problems, namely,

7) The overpopulation of the Earth.

8) The danger of atomic world war.

9) The danger of world-wide civil war.

10) The poisoning of air, water, soil and food by radioactive and other waste materials, like detergents, insecticides and pesticides.

11) The increasing concentration of hereditary diseases in the biological substance of mankind.

12) Biological and psychological manipulation of human beings.

Every single one of these dangers is capable of annihilating the human race. Whether they can be averted or only delayed, is not certain.

What is certain, is that it will need an immense effort, first of research and then of investment and work in science and education, if we are to have even a chance of saving man.

What is equally certain, is that the generation which is now in its infancy will perish in the first half of the next century in a global catastrophe of unimaginable dimensions, or reshape the world to an equally unimaginable extent.

The reason for this is obvious: At its present rate of growth, the population of the world doubles itself theoretically within 30 years, and will soon do so within 25 and 20 years; but it is impossible for 20 to 25 billion people to exist on the earth, which would be the case for approximately the year 2050.

End of Technical Progress

One thing is certain, technology will not provide us with any magic weapon against these global dangers.

Technical development is by now foreseeable and is rapidly approaching its end. The trunk and the main branches of the technical tree reached their full growth by the middle of the century. Most of its branches have achieved their full size and cannot be expected to produce more than a few minor twigs; some have already died; and one sees no main branch which offers prospects.

The technical fields which are fully or almost fully developed are:

- 1) Transport by land, water and air.
- 2) Communications.
- 3) Processes for obtaining raw materials and semi-finished and finished goods.
- 4) Transmission of energy, including the production of electrodynamical energy and the transformation of energy.
- 5) Techniques of Warfare.

Quantitative and organizational increases may still be expected in:

- 1) Computers and automation.
- 2) Space travel (with a landing on Mars and the construction of space stations, as the limit of space-travel technology).
- 3) Measuring and observation techniques.
- 4) Building.
- 5) Production of electrical energy (direct conversion of fuel energy to electricity).

6) Energy production by nuclear fission.

7) Technology of Food production and water retrieval.

Qualitative advance may *perhaps* be expected in:

- 1) Production of energy by nuclear fusion.
- 2) Synthetic food production (proteins from mineral oil, breaking down of cellulose, artificial photosynthesis).
- 3) Supply of geothermic energy.

The state of the world is that of a body free fall, with annihilation at the end unless it can be stopped; and only the presently known or realizable methods and means of research and technical operation are at our disposal for stopping it.

The inclusion of one important remark should be added here: the world dangers which we have enumerated are *symptoms and not causes* of the present developments in our world. In order to cure the world, the real healing process must come from the causes. But like the physician who normally confines himself to natural methods must resort to surgery in order to deal with a perforated appendix, emergency measures to save the world from its acute danger will have to lie on the symptomatic plane. At the same time, the search for causes and ways to remedy them remains the assignment of the higher order.

The symptoms can and must in the first place be, so to say, approached surgically: by rational methods of research and technical operation. The

approach to, and cure of, the causes is only possible from a totally different angle, and we must never forget that while we deal with the symptoms.

*The Importance of Research for the
Diagnosis, Prognosis and Therapy of the Present World Problems*

What is required of us, is, therefore:

Diagnosis,
Prognosis, and
Therapy

and in the case of the latter we shall, for the present, have to confine ourselves, in a conscious act of resignation, to Symptom Therapy.

In the field of diagnosis, there have lately been many very sensible contributions, but they have not gone beyond an essentially ineffective "admonitionism."

The prognosis should be defined asymptotically by two limits: a lower limit given by the assumption that the world situation is abandoned to its own course without basically new guiding measures; and an upper limit determined by the utopical supposition of a completely flawless prognosis, perfect insight and a sincere will to change the world process on the part of all men and particularly of those responsible for science, the economy, technical development, politics and education, and finally, of the availability of unlimited means.

Between both these asymptotes we shall find the achievable.

Between these two limits lies the most enormous research assignment with which mankind has ever been confronted. If we are to conceive it, we should first of all recall again that it confines itself consciously to symptomatic prognosis and therapy and excludes the search for the spiritual, philosophical and religious roots of the present condition of the world and the possibility of curing them — not because they are unimportant, but because the immediately necessary steps to avert the worldwide disaster cannot wait for the spiritual renewal of man.

The immediate research programme which must be formulated and carried out now is so immense, that it will probably require part of the potential of all the universities and scientific institutes of the world. Without giving up an inch of the individual freedom of research, the setting of far goals and planning of research will be necessary, because the limited capacity of individuals is no more sufficient for the unlimited multitude and manifold possibilities of research subjects.

Synoptic Suprascience

The first and most important subject is "What must be researched".

It can only be approached from a synoptic knowledge of all sciences; in other words, it requires an entirely new synthetic and synoptic suprascience. There is hardly a branch of human knowledge which does not extend into this

new, total field of vision.

What must the new super-scientist be like?

Since at least three to four decades there could not evolve a Universal Scientist, because during all that time it became more and more impossible even for the specialist to master his whole special field and to keep abreast of all of its developments.

The answer is: Between the philosophical basic structure of many separated fields of science and knowledge, there are inter-relationships, symbolic relationships, and concurring patterns which are founded on the fundamental laws of the creative universe.

These relationships are accessible to the researcher only if he undergoes a total reorientation: from the analytical approach which leads him away from the common centre and into specialization, to a centripetal synthesis of all fields of science.

The day will come when this synthetic science will, so to say, be a master key to all human knowledge and even open up new, still unknown fields.

The time is ripe for this reorientation, but the scientist can only achieve it if he bases his research on the existing material made available by the dedicated, reliable work of specialists. Thus the time has come when all specialized knowledge, achieved in the last two hundred years, will bear its rich fruits.

The basic, overall question of what has to be the subject of research can only be dealt with by the leading experts in all fields, and particularly those in:

Physics

Chemistry

Engineering

Ecology, Biology, Medicine

Geography, Global Planning, Agriculture and Forestry

Transportation, Town Planning

Organization, Administration, Statistics, Cybernetics

Philosophy, Theology, Pedagogy

Anthropology, Ethnology, Psychology

Law

Economics, Sociology

Two examples may suffice to show how all these fields are intricately interwoven: The World-Food-Problem and the World-Energy-Problem.

Food scientists state that the globe can feed 30 billion people, but in the year 2000 our earth will certainly not be able to feed 6 Billion if we cannot start to establish adequate conditions now and on the broadest possible basis. By the way, the figures of these food scientists are completely valueless, if they leave out the other problems involved (e.g. energy, housing, education, road-building, traffic, industrial production, supply of drinking water and the elimination of waste products, etc.).

In order to supply the necessary energy, ever new atom reactors are built with each of them releasing an exact known amount of radioactive waste material in the form of gases into the atmosphere or of radioactive chemical mud, etc. onto the soil surface. Nobody knows the genetical consequences in the course of generations. Solutions may possibly be found for energy transport over superlarge distances (e.g. from the hydraulic sources of the Himalaya to Europe) if the same scientific and technical effort could be put into these problems as into those of atomic-energy. Electricity is not possible to transport economically over such distances, but there may be other solutions for instance, to find chemical compounds or elements rich in energy, the energy content of which can be transformed through fuel-cells into electrical energy.

Five Examples of Research Subjects

Within the compass of this general subject there are hundreds, or probably thousands, of pragmatic single research projects. By way of example, we shall select a few taken from five entirely different fields:

- Garbage Disposal
- Development Aid
- Organization of the Economy
- The School Problem
- Landscape Planning

Garbage Disposal:

The first subject may be briefly defined as follows: Virtually all industrial products of the entire globe end up sooner or later on the garbage heap.

Even now it is no longer possible to dispose of this garbage simply by means of dumps; not only for lack of space, but also because of the danger of pests, and the pollution of subsoil water. Incinerators offer no solution either, because the large volume of PVC-based plastics (foil, bottles, packaging) based on Polyvinyl-hydrogen dichloride produce hydrochloric acid which, when dissolved by rainwater, poisons the vegetation as well as the underground water. Ultimately, we shall have to develop a disintegration industry which breaks the used products down into their components again or converts them into harmless compounds (e.g., by combining the chlorine of the PVC with sodium to cooking salt).

Such garbage conversion plants in turn involve a tremendous organization of collecting, sorting and transporting the garbage, and probably also far-reaching restrictions of production and consumption, for instance, the prohibition of the manufacture of plastics containing Cl.

A great research effort will be required to investigate the requirements of space, energy, personnel, organization and operation and the expense involved, financing possibilities and legal aspects of even this small sector of the garbage problem.

Part of the garbage problem is also the disposal of industrial waste of all kinds, the exhaust gases of factories, traffic and home, all of which are harmful to human, animal and vegetative life through air pollution, the possibility of irreversible climatic changes (greenhouse effect), etc.

One completely unsolved problem is that of nuclear waste.*

A special field in its own right is the water problem. Would the surface water of the earth be sufficient for human needs if it should remain completely free from pollution by sewage? And if so, would it be possible to purify all sewage on a decentralized basis at its points of origin (keeping in mind that our present sedimentation system cannot effectively purify sewage), or would it be possible to transport it by pipeline, along river beds, to the coast for reconditioning in large plants? How? By means of what physical, chemical or biological processes can we assure the conversion of all harmful substances to harmless compounds or their reduction to their elements? (*Remark: see p. 39*).

The discussion of even this one aspect of the garbage problem alone — which we have merely touched on — shows already that what is involved is not only an enormous research effort aiming entirely at practical solutions, but also an equally enormous investment of money and labour.

We shall come to similar results with every single problem which has to be solved within the main subjects previously enumerated; particularly those connected with the food and energy supply for the entire world population will require a many times larger financial and manpower investment. No one in the entire world will be in a position to abstain from contributing his share to those efforts. In other words, the age of prosperity and leisure which some of the Western nations were able to enjoy in the twentieth century will within a few decades have passed into the realm of legendary memory, probably forever. Only by great sacrifices on the part of every individual can the preservation of the human race be assured. Measured by these prospects, the preoccupations of today's politicians and generals everywhere in the world seem horrifyingly irrelevant — like passengers on a sinking ship without boats who still quarrel about their gambling winnings.

The garbage problem and the water supply problem which is part of it, has only been randomly selected as an example; it is a matter of scientific and technical nature.

Development Aid

Of a totally different nature is the problem of aid for the developing countries. Here the approach must be primarily one of helping people: only

* Remark of the editor: The first hopeful steps in this direction have been carried out in experiments by a biological breaking down of radioactive mud by growing certain plantspecies on it. The experiments are made by Dr. Kathe Seidel at the Plant-breeding Institute of the Max-Planck Gesellschaft and her team is now also elected as one of the Units of the disseminated World University of WAAS.

thus can economic, technical and administrative progress in the situation of these nations be achieved fruitfully.

No one can yet say whether it is right for the developing nations to advance rapidly towards the status of modern industrial nations, or whether there are other patterns of life that are more appropriate for them, being based on their history, their conception of humanity, their religion and their ethnical community patterns. To determine this requires, apart from technical and scientific research, first and foremost investigations by ethnologists, historians, anthropologists, sociologists and medical experts. One need, at any rate, is known: the need for teachers and more teachers. What is needed, are not lawyers and physicists trained in Oxford or Paris; the subjects that must be taught are first reading, writing, arithmetic, hygiene; then crafts, agriculture and irrigation, and only in the third place, administration, law and higher sciences.

The money which the industrially developed countries give the others must be given in a spirit of true partnership and responsibility, exclusively in order to help, and not with afterthoughts of financial profits or gain in power, as is the case now. In every country and in every field, conditions and requirements are different, so that a high degree of specialized knowledge is needed in order to determine the right form of aid for every case. Any given Western country should therefore adopt only one or a few developing countries with which it should develop close relations; subject, of course, to a world-wide comprehensive plan and spatial coordination scheme, which must be worked out in advance as a major research project. All this, however, is only possible if national considerations of power politics or ideological politics are ruled out entirely.

The Economic System

After having considered a purely technical problem (garbage disposal) and one which, in addition to its technical aspects, involves a good deal of educational issues (development aid), we shall now discuss the outline of a problem of economic organization.

The Western world, with its capitalist system permits itself the luxury of an enormous waste of unproductive work. Competition and publicity are only externally visible symptoms; at the root of the system lies the wrong conception of the enmity of all against all as Darwin postulates it in his "struggle for life".

But, there is still another motive force, though the sociologists generally know nothing about it, because few of them have ever had an opportunity to share in it: the joy of achievement, which in every good enterprise encompasses a good deal of the manpower: usually all the white-collar workers from the management through the engineers and commercial staff to the foremen, but also the skilled and veteran workers and the better qualified among the young workers and apprentices.

Much use is made of the worn out slogan of the worker as a mechanical slave of the production line. There is such a thing, unfortunately. But what sociologist has an idea of how few industrial enterprises work on the mechanical production line principle, compared with those where the worker performs a highly qualified and responsible job. The deadening jobs of the production line at which a worker always performs one single mechanical operation is nothing but a passing intermediate stage between highly qualified mental and physical labour on the one hand — which will always exist — and the coming full automation of complete production branches on the other hand.

This positive element of satisfaction in work must be kept in view, because it will have to play a vital part in a new economic system motivated by the preservation of the human race rather than by the desire for profits.

That Marxism as an economic system can also not be viable for the future, need not be expounded theoretically. It is proved by the practical experience of the Soviet Union in the course of half a century. Its undoubted enormous material achievements have been bought at the price of the personal liberty and happiness and even the very lives of millions.

Only an entirely new economic system, which probably will have to involve certain changes in property rights, may possibly be able to assure human survival. Its aim for the next 50 to 100 years will be to supply the essential minimum for the survival of the entire human race, and its moving force will consist of individual liberty, joy in achievement, personal success for all, and the meaningful integration of the individual's contribution in a whole of common effort and common achievement which is within his comprehension.

To secure a survival minimum for all may seem a ridiculously low aim in our present surplus economy; but even now, in this year, of 1969, two million people throughout the world die of starvation every month, while mountains of surplus food stuffs accumulate in other places and premiums are paid for their destruction.

To create a new economic system is one of the greatest research tasks which must be achieved if the world is to survive. Here again, only a supra-national, global solution is thinkable. Manufacturers, economists, legal experts, sociologists, ecologists, psychologists and educators, but also industrial designers, process engineers and technical development experts will have to make a common effort to solve it.

Indications of a possible solution are not lacking. As long ago as in the First World War, a basic contribution was made by Walter Rathenau (*"Von kommenden Dingen"*, S. Fischer, 1917). Rathenau, who was general manager of one of the largest industrial concerns in Germany, the AEG, was aware of the importance of the joy of achievement for man as a worker, that is to say, of the moral capacity of nearly all men, even the "simplest", for combining liberty and personal striving for success with serving as part of a greater common whole and perhaps even seeing this whole as part of a pyramid of

higher and farther aims. The question, as Rathenau puts it, is therefore one of designing an economic system in which freedom and the individual will to succeed need not be sacrificed to service for higher causes, but can develop and find fulfilment in that service.

What Rathenau proposed is, in general outline, that the companies should use their accumulated reserves to buy back their shares, so that the enterprises would become their own owners. From that point, the profits which remain after deduction of (reduced) taxes and the creation of the necessary reserves would be made available for the great tasks of humanity and particularly for cultural purposes, which, for instance in the field of education, should be largely taken out of the hands of the State and entrusted to private enterprise.

Whatever the face of the economic and social system to come will be, it will hardly be possible to disregard Rathenau's suggestions completely.

Man and Landscape

Fourth, a subject which lies in an entirely different plane again: and at first sight not particularly important subsidiary of the field of planning and land use, namely, the integration of man and his works into the landscape. By "works" I mean housing, transport, industry, production and distribution of energy, garbage disposal, agriculture, forestry, and anything else man must "build" on this earth in order to live.

Not more than two hundred years ago, man seems to have been able to fit himself and his works organically into the landscape. Villages and towns, castles and convents, fields, woods, vineyards, roads, chapels and bridges, farms and mills were one with their natural environment. Not that any of it was "planned", but because the human mind harmonized with nature, with sowing and reaping, with the months and seasons, with the woods, rivers and seas and the animal world.

This order, which still is much alive in East Asia, has been grossly infringed on by the rapidly destructive arrogance of the technical age. Planning is nowadays frequently entrusted to inferior officials and municipal councils, who decide what irreparable damage and uglification shall be perpetrated on the landscape. Our technical needs require nothing like the landscape destruction that is being practiced these days. There are, after all, highroads, bridges and power stations that fit well, or at least tolerably well, into the natural environment. Even worse than our industrial installations are most of our settlement. To build asphalt jungles with termite hives of thousands of mechanized dwelling units, and then to preserve nature in museums — euphemistically referred to as reservations — is no solution. The reintegration of man in the landscape and the development of new ways of organic landscape planning are on the one hand a question of education, and on the other hand yet another great technical-scientific and organizational research project that is vitally important for the mental and psychological foundations of the coming generations.

The School Problem

When we inquire into the world's problems, we find again and again that an overriding question is that of education. In fact, if we want not only to treat the symptoms but to cure the deeper causes of the global dangers, we shall have to admit that the cure can only be achieved by education. As long as our western schools convey 90% or more of mere informational material to young people whose need of rational knowledge is only a fraction of their hunger for understanding and of the real needs of their life, we must not be surprised by the self-destruction which we have brought upon ourselves and our planet.

What is needed is an entirely new school; and that means first of all entirely new ways of training teachers.

I have already referred to the break between the two poles of action and contemplation, creation and intuition, working and being worked upon, action and surrender. In the healthy human at any age, they complement each other.

If, then, this break between the two complementary poles of healthy human existence lies at the root of the disease of our times, it is also the point from which a cure must start. We shall therefore have to consider this question in greater depth.

Every age produces the human paradigmata that befit it: Antiquity the image of the hero and the philosopher, the Middle Ages the knight and the monk, Ancient Japan the samurai and the poet. If the age is healthy, the two attitudes to life complement each other, even within the individual, the monk has also something of the knight in him, and the knight something of the monk. These paradigmata always realize the two modes of existence: action and contemplation. As long as the two modes complement each other, meaningful existence is possible.

It is not true that children do not like to learn. Quite the contrary. The urge to learn is one of the highest fulfillments of the child's being. Therefore, it asks unceasingly "why, why?", until its inquisitiveness is turned into contempt at school where it is taught everything it did not ask for, but "will need later on".

Childhood and youth are not meant to prepare for future money earning, or destined to supply the economy with well-trained manpower so that they may be "usefully incorporated into the process of production". Youth serves for the unfolding of human nature and embodies its own values, a condition dedicated to exuberance, not to profits.

We can safely assume that, in childhood and youth, every entity exists unbroken of deed and experience, and strives for accomplishment and development. Therefore, a new system of education must commence by preserving this condition and developing man from it, so that all spheres of existence can reach fulfillment at every age. Therefore, we must demand — if somewhat crudely stated — that the new school consists of, one-third knowledge, one-

third deed and one-third experience, offered in a way that satisfies the urge for learning, for creating and for contemplative devotion. If these are guided to their highest possibilities by an educational system, then new generations will grow up who will heal the causes of the present global dangers, and not only their symptoms.

"To throw spears and honour the Gods": this means at one and the same time a state of existence intended by nature, and the education of youth in which action and contemplation, creation and perception, struggle and surrender are equilibrated in mutual involvement and fulfillment.

Professional skill is to be taught at colleges and trade schools. The actual curriculum of the school can be immensely reduced. Language tuition is to be restricted to an easy learning of English before the age of 10. At this age, the child's wonderful capacity to acquire a language within the period of a few months by hearing alone, saves endless bother with grammar and nouns in later years. It is of course nice to know Greek and French, but the access to antique or French culture is possible without the knowledge of their tongues, just as we have it to Russian literature, to Chinese poetry or to the magic of Africa. It depends on the faculty of perception. English must be taught, not because it has a special culture, but because we need most urgently an international means of communication and for this purpose, for many reasons, only English is still valid.*

In order to ascertain what can be saved on actual memory storage, it suffices to put the following questions to a middle aged adult with average education: for what purpose is the table of logarithm used? who fought at the battle of Koenigsgratz? what are the usual processes for the production of sulphuric acid? what made Henri IV famous? what is a cotangent?, and so on.

Questions of this level constitute the minimum of what must be stored by memory in order to attain a so-called average maturity. No answers will be obtained, unless the person so examined is involved in the subjects concerned through either profession or hobby. Therefore, the storage of all this knowledge serves no useful purpose. But the method by which it was acquired can not have been futile. It only depended on the teacher, but many other subjects of higher education were available. Such as, the important connections between the history of culture and philosophy concerning the entire planet, the mutual relationship in the realm of nature, mineral, vegetal and animal, the substance of abstraction, its methods and uses as against the intuitive recognition or associative relationship of phenomena and ideas.

Under creative education, we must understand every performance that is ego-stressed, subjective, offensive; under experiencing or contemplating, everything self-effacing that is palpable, useful, everything that stimulates an

Remark: See also the article "War or Peace — a Biological Problem" by Europeaus (H.B.), pages 301-315 in "Science and the Future of Mankind", Vol. I, of the WAAS-Series, The Hague 1961.

awe-inspired grasp of the world. With youth, both spheres will be strongly related to nature, to everything alive, and to the elements, fire, water, air and earth.

The roads to action and contemplation often complete each other and overlap. Action embraces everything that hitherto falls under the heading of sport and physical exercises. Further, we must think of extended, toughening hikes and camps in the bosom of nature, even in real wilderness and also in winter. Also training for mountain guard duty as guides, skiers, sailors, lifeguards, employment of the older pupils in emergency duties and sea and rescue services. But all this must not stand under the sign of quantitative competitive performance like present-day sports, nor be done for the purpose of toughening up only. It must always be an identification with nature.

On the other hand, contemplative education should never be entirely passive, but always connected with personal creation. Dancing belongs to it, an actual educative expression we have neglected, but has been cultivated much more by the Russian and Asian cultures, as well as by the primitive peoples of Africa and by the Indians.

Here belongs, moreover, the involvement with everything alive, taking tender care of plant and animal, starting with the flower pot where the small child can already experience the miracle of growth of the pea it has planted, up to planning gardens and the care of plant and animal communities, and landscaping. As far as possible, animals should not be kept in cages or aquaria, but at its best in "planned" or "tended wilderness". A piece of land, an abandoned quarry with a spring, for example, in which plants and animals gradually make their homes, birds, small mammals, ants, bees and water creatures, in a natural equilibrium.

To contemplative education also belong all the disciplines related to the muses and the arts, but more enlarged and thorough. Drawing and painting, for example, should be less oriented at the emotional self-expression of children's drawings which, today, are overrated, but rather on the self-effacing, tranquil perception of East-Asia's artistic presentation of nature.

Study of the mother tongue should occupy much place. The actual fostering of style, declamation and speaking choirs, and poetic experimentation somewhat after the fashion of the Japanese Haiku.

Myths, legends and fairy tales of all times and all peoples should be taught as well as the arts of the entire world, from Altamira until this day.

The doctrine of natural forms, their completeness and reciprocal relationships should be taught instead of the present subjects of genes, chromosomes, enzymes and DNS; and instead of computers, laser or the electronic microscope, the knowledge of the order in the cosmos, from the atom to the galactic systems and the place of life in this order.

He who has graduated from such a school, will be no less skilled at his profession than today's graduates. But he will search for other purposes and

other objectives in his life. This inner soundness will inspire him to strive for a better world. Therefore, the new school is the most important presupposition for a world, healthy not only in its symptoms, but basically so.

Will it still be an "artificial" world? As long as humanity numbers more than one billion, a high degree of technology remains indispensable. But with the forthcoming end of technological progress, the dynamism of its civilizational stimulus will cease. Technology will revert to be a tool only, and through the rediscovery of the true values, it will occupy the place it deserves.

Should the number of humans sink below this limit, it may safely be assumed that modern technology, which originated in physics, will remain a passing episode in the history of humanity, placed between the Renaissance and sometime during the third millennium. For our present situation, this question is irrelevant.

It will be most difficult to change the school system of the Western world in the manner suggested. Even so, it ought to be tried, at least, in some private schools. It would however be easier in the so-called developing countries, where a school system must be started from the ground up.

Practical Possibilities for the Realization of Cardinal Koenig's Proposals

Out of the all but infinite abundance of research objectives presenting themselves, we have picked out at random five belonging to different spheres, in order to show how versatile and manifold are the tasks and what effort in research capacity is required in order to broach, let alone master, the most urgent problems. How could it be done? Are any possibilities apparent?

Here, the offer of Cardinal Koenig points at the possibility of an answer by natural scientists.

If one recognizes, on the one hand, that a large part of the research resources of all Universities and scientific institutes the world over must be enrolled for the tasks on hand, one also recognizes that, prior to this, the focal theme of "what must be investigated" is to be elaborated at some central place or in closest cooperation between the most prominent institutes, with an optimal investment of resolution, endeavour and ability. It is this working group which must be created.

Its task, however, presupposes more than erudition and rational perception. As a minimum requirement for the cure of the world situation, it presupposes a knowing insight into the causes of the present developments and the trends of their dynamism. The researchers engaged on the central theme must, therefore, agree among themselves or at least be of spiritual affinity in their attitude towards the dangers of the world and their causes.

When such an identity of the inner attitude exists between men conscious of their partnership in a great and responsibility-laden task, then what originates

in them is much more than the fellowship of shared work today called a team-spirit.

Looking for a word describing the kind of being together and working together in this sense, I could think of no better one than "order". It is the nearest in concept that can be found, if we free ourselves from all historical associations, that may cling to this word. An order of this kind uniting people in recognition, attitude and purpose, truly can become the highest form of a spiritual and creative community of human beings.

To this sphere belong part of the experiences with people and human souls of which Cardinal Koenig speaks and whom he offers to unite in cooperation.

The character of the central research community (Forschungsgemeinschaft) to be established must be closer to the order than to the team.

It does not suffice, for the outer form of communion, to have some loose cooperation, in which case each remains at his own place of residence and work, and contact is maintained through publications, correspondence, and occasional symposia. The central research community must be concentrated in one place.

The character of the central research station must be closer to that of a monastery than to that of an institute.

With this word, too, we must think without any historical or ecclesiastical association. A place of meditation and undisturbed research, screened from din, bustle and commotion, of continuous exchange of ideas within a circle submitted to the same rules of retreat as well as with the entire world of intellect beyond the walls — this can well lead to fertile creation, and embarking upon action and contemplation such as the world has never known hitherto. Whoever has experienced a successful convention of intellectuals — called symposium — and sensed how, from the second or third day onwards a reciprocal spiritual induction prevails and the outer, everyday world recedes behind the emotion and intensity of spiritual contact and mutual new perception and "brain-waves" — can also believe what it would mean if such an order-like intellectual community had the opportunity to devote itself, in monastic protection, to a spiritual task of the greatest urgency.*

On the subject of monastic communities too, the Catholic Church possesses some of those human experiences which the Cardinal mentioned.

One could visualize the possibility, or desirability, of the Catholic Church contributing by means of one of the larger monasteries disposing of the re-

* Editor's Remark: It may be recalled that the Rockefeller Foundation has created something similar near Lugano, where a number of scientists working on the same research project can live, for a while, in seclusion in order to work out their common programme supported by all facilities at their disposal and enlightened by the great beauty of this natural environment.

quired facilities, gardens and courtyards for housing, research and contemplation for those scientists who pledge themselves to cooperation. In this connection, one would visualize a selected focal community which, in a certain sense, carries the monastic academy that is to be established and belonging to it for extended periods of time, but still interrupting the seclusion occasionally in order to travel abroad; a further group acting in the schools and institutes "outside" but belonging to the "order" and returning periodically into retirement, and, finally, a third group of guests who stay for more or less extended periods (but never less than one week).

It would be desirable, if such a community could be set up as a spiritual-worldly order, i.e. without ecclesiastical attributes. Its establishment and organization, however, would be one of the accomplishments the Christian Churches can contribute in the spirit of Cardinal Koenig's offer.

It may be that the creation of a spiritual non-or supra ecclesiastical order is nothing but an unrealistic dream; that its establishment will run aground because of matters of competence, conceit, ambitions for power and influence — in short, human nature. But so much depends on it that no time can be wasted. Action is needed.

Competent authorities may even think of the establishment of a new Order of the Catholic Church trying thus a part solution. Confidence in the modern, to the future oriented offer of Cardinal Koenig justifies the assumption that it would be possible to set up an Order of an entirely novel tenor which as the home of the monastic academy, would house scientists of all trends and all nationalities either for longer stays (perhaps in the manner of lay brothers) or for short attendance. It may even be presumed that the emphasis of such a new ecclesiastical order will not be on the church traditions and dogmas unacceptable to scientists, but on a spiritual readiness for new, as yet unexperienced religious impulses.

I do not possess the opinion of any of the existing Church communities. I only know that, for myself and for a great many of my contemporaries, the religiosity as represented by the Churches of all denominations does not mean an inner enrichment or fulfillment, even though I consider myself a religion-bound and seeking person.

It does not seem to me to be excluded that, in a new spiritual-secular order, in connection with the monastic research academy, events and experiences of the greatest spiritual-historical significance may reveal themselves.

Cyclotrons and electronic microscopes are not required as research equipment, neither are laboratories; these are available in the Universities and industrial institutes the world over. What is needed, is a comprehensive library and organized fast communication with the main libraries at home and abroad. Needed are telex communication with all the main research institutes the world over, at a later stage, probably also large data-storing and reference facilities. Neither are personal luxuries required, for a life devoted to mental tasks is

eo ipso of ascetic nature. But what is needed, is room for mental activities, discussion and communication, as well as for contemplative relaxation. Music rooms, theatre sets, a patio, alley, garden, and animals, flowers and works of art. One can think of a spacious hall dedicated exclusively to large communal festive gatherings, as well as of smaller rooms reserved for the solemn meditation of individuals, reminiscent less of the Church chapels than of the bamboo-cells on a pond, where Chinese emperors were wont to withdraw.

The compound should be secluded in the countryside, untouched as far as possible, remote from traffic, industry and holidaymakers. There shall obviously be sports facilities, tennis courts, swimming pool, gymnastics and playing halls, opportunity for ski-ing, hiking and gliding.

But inspite of all those "worldly" installations, the new foundation shall not have the least resemblance to those hotel-like convention places where even today intellectuals gather (even though nothing is intended to say against their sense or importance). Rather, the obligation to the order-like segregation of this community shall, from the outset, *exclude every suggestion of non-commitment*, which marks today's academic life.

A special characteristic of such a University should be the transformation of the Missions (of all denominations) to the educational systems of the developing countries, as well as the training of teachers from these very countries. The foremost future task of the Missions, as they were up to the present, however, should be, to become the mediators for *mutual exchange* between the West and the developing countries, whereby the West supplies material goods, while the recipient countries transmit something of their personality, the cultural heritage that has hitherto been mostly overlooked by the West.

One further step would be possible in connection with this new establishment: assuming that a partnership with one of the developing countries leads to the recognition that this country needs, first and foremost, tools, farming implements, animal-drawn vehicles, irrigation systems, water — and wind-mills — then the building of a factory should be considered for the production of these articles, to be organized on the ideas of Rathenau, i.e. surpluses are not to be used for augmenting the wealth of the financiers. After deduction of the reserves, capital interest and taxes, the balance of profits is to be partly shared among the personnel — for which many rational ratings exist according to responsibilities, duration of employment and accomplishment — while the major part would serve the purpose of the "Order", whether in development aid, the expansion of the school or research.

This factory, originally conceived as a pilot plant, may well grow into an important industrial combine and produce such articles for all developing countries, i.e. also for the trust territories of all the other Western states, and thus breach the first gap into the outdated patterns of today's Western and Eastern economic systems.

REMARK OF THE EDITOR TO PAGE 28 (POLLUTION):

A scientific breakthrough found independently in West Germany and in Israel in recent years offers an inexpensive solution for the purification of highly polluted waters containing either too much mineral salts (like most desert underground waters) or too much organic compounds (e.g., urban and industrial waste waters) or both.

These results have already found their practical application on an economic scale at various places in Germany, Holland and Israel with great success.

Both lines of purification are based on the same principle: A number of certain plant species of a higher order (Cormophyta) are able to break down such noxious or poisonous compounds as chlorides, phenols, indols, detergents, etc., and also at the same time they destroy dangerous microorganisms, worm eggs, etc. by root exudations. This principle regarding mineralic pollution ("Biological Desalination by Cormophyta") was found by H. Boyko in Israel (1958) and regarding organic compounds and the destruction of dangerous microorganisms by K. Seidel, West Germany (1961). The biochemical research work has been carried out by R. Kickuth, Goettingen.

The building of one of the first World Task Forces is now in preparation by the World University of WAAS in order to deal with the vital problem of pollution on a global scale. The official priority given by the highest authorities of U.S.A. to find solutions to the pollution danger, is a highly encouraging step.

The effectiveness of water purification by such Cormophyta may be shown by the example of *Scirpus lacustris* L. with regard to the destruction of dangerous microorganisms:

TABLE:

REDUCTION OF BACTERIUM COLI BY SCIRPUS LACUSTRIS L.

(The experiments were made in 1000ml bottles with highly polluted and infected water, and later verified in the field)

Published by K. Seidel in: Die Naturwissenschaften 51/16:359-397, Berlin 1964.

Date	Number of <i>B.coli</i> per milliliter in bottle with plants	Number of <i>B.coli</i> per milliliter in control bottles without plants
30 June, 1961	43,800,000	43,800,000
3 July, "	15,000	43,000,000
4 " "	1,000	29,000,000
5 " "	1,345	35,500,000
6 " "	300	34,600,000
7 " "	86	15,000,000
10 " "	54	22,950,000
11 " "	27	14,000,000
12 " "	400	22,000,000
13 " "	1,100	12,000,000
14 " "	220	6,000,000
17 " "	—	4,000,000

Publications

1. WAAS-Series, Vol. VI.

Introductory Remarks by HUGO BOYKO:

Volume VI. of our WAAS-Series is now in print and will be published in March 1970. Its title is: "The World Religions Speak on The Relevance of Religion in the Modern World".

This Volume presents the Proceedings of the First Spiritual Summit Conference held in Calcutta, October 1968. This Conference with its completely new aspects is a new and important step in our World. The meaning of this Conference is best elucidated by the Foreword of Professor Stuart Mudd and the Introductory Lecture by Professor Huston Smith, of which an abstract is presented here.

The tendency of many religious leaders today to close the seemingly wide gap between the various religions is a good omen. It creates a basis for much success in the efforts to avert the threatening world crisis, dealt with in the Transnational Forum of this issue.

Finley P. Dunne Jr., Executive Director of the Temple of Understanding in Washington, tells us in his Preface to this Volume that "The participants," for the better part of a week mingled with one another in an informal and spiritually enriching way. The hours of participation in the regular sessions of the conference were greatly outmatched by the hours they spent in intimate and animated conversations, in small and large groups. What resulted was a communication that, in the words of THOMAS MERTON, who was deeply involved in all of it, was "not communication, but communion."

The reason why the World Academy of Art and Science or its American Division respectively gladly agreed to the request of the Temple of Understanding to publish the Proceedings of this Conference under its auspices is clear. It is for the first time that an elite of religious leaders of two and a half thousand million people discussed together not the dividing points, but the common ideas of all these religions, in order to find the ways for a common work. How successful this first trial was is best seen by the unanimously voted Final Declaration, which called for the active and practical steps to further this work, which may be as important for the necessary unification of all groups of mankind in the fight for survival in our modern world as are the transnational efforts of scientists and those of Statesmen and political leaders in the secular fields.

Foreword to Vol. VI

Since our hominid ancestors first evolved to become human, thoughtful men have observed and pondered the world about them. Even the most primitive men could observe the ordered progression of the stars about the poles with each diurnal cycle and their movement through each season. They could observe, even though with only simple understanding, the marvelous self-regulating capabilities of living beings to perpetuate themselves and to adapt to changing conditions through progressive evolution. Primitive peoples sought to interpret the forces of nature in animistic terms intelligible within their own experience.

The emergence of the Prophets and Founders of the World Religions gave men more enlightened conceptions of the universal order and its mysterious and all prevailing harmony. As a practitioner of natural science, I regard the Prophets and Saints of the World Religions, and those who have followed them, as predecessors in the search for enlightenment.

To understand the cosmic order is the goal of science. Can we truly understand the microcosms of the atoms, with their unimaginable complexity of electrons whirling about their nuclei? Can we truly understand the complexity of the atomic nucleus, with its protons, neutrons and powerful binding forces? Whence the regularity, the stability, the order in these incredible microcosms? Can we adequately comprehend the ordered evolution of cosmic clouds, stars and galaxies in the macrocosmos?

Can we really understand a living cell, even a microbial cell? We visualize with the electron microscope cell membranes, cytoplasm, a nuclear area, with its skein of deoxyribonucleic acid bearing the genetic blue print. We even break the genetic code and discern how the alphabet of four basepairs is translated into the alphabet of twenty amino acids, and these in turn into the catalysts which regulate structure and function. We isolate the enzymes and their substrates, and reconstitute their several functions one by one. But the microbial cell, invisible to the naked eye, can carry out simultaneously and in a few minutes an ordered succession of chemical interactions, transformations and syntheses which the most modern laboratory in a scientific world cannot dupli-

* Professor STUART MUDD is Vice President of the World Academy of Art and Science and Chairman of its Publication Committee. As Microbiologist he is Past President of IAMS (the International Association of Microbiological Societies).

cate. Whence the logistics, the ordered sequence, required for survival? Whence, indeed, the urge in religionist and scientist alike to probe the ultimate mysteries and to achieve harmonious relationship to the Divine or Cosmic Order?

At the core of every scientific problem into which I have ever inquired in sufficient depth, is mystery, the profound mystery of order and adaptedness. I aspire to gain in understanding of this mysterious Cosmic Order by the procedures in which I have been trained as a natural scientist: observation and experiment; induction; deduction; verification.

To the religionist who aspires to gain in understanding of the ultimate mysteries of the spirit and its relation to the Divine Order, by whatsoever means of inspiration, meditation, devotion prove effectual for him, should the scientist not say:

We are both Seekers. May we both gain in understanding and in achieving harmony with the mysterious Order in which we live.

A great contemporary scientist has written:* "To pursue science is not to disparage the things of the spirit. In fact, to pursue science rightly is to furnish a framework on which the spirit may rise... Science has a simple faith, which transcends utility. Nearly all men of science, all men of learning for that matter, and men of simple ways too, have it in some form and in some degree. It is the faith that it is the privilege of man to learn to understand, and that this is his mission."

The understanding to be sought embraces the ecology of our entire planet, the well-being and quality of life of all mankind. The understanding should include the religious insights and aspirations of man, the verified discoveries of science, the useful applications of technology. The goals should be optimally viable economic and social organization in relation to the entire planet, the good life for all mankind; for the unit of survival in the presently emerging world is not one particular religious, ethnic or political group, but *Mankind*.

The primary purpose for which the World Academy of Art and Science is chartered is to provide a forum for the discussion, without bias, of matters of concern to all Mankind. Certainly the world's religions are of profound significance and relevance to Man.

As an observer at the Spiritual Summit Conference from the field of natural science, it has been profoundly reassuring to me to see that all religions share the common aspiration to gain in understanding of the Divine or the Cosmic Order, and to bring man into Harmonious relation to that Order. As a working scientist, this is also my aspiration. It is reassuring, also, to see that the orientation to human conduct of all religions stresses justice, compassion, love. There is thus a common human basis of aspiration and behaviour for all men of good will.

* VANNIVER BUSH, 1968. "The Search for Understanding" American Scientist 56: 298-301.

The Relevance of the Great Religions for the Modern World

EXTRACT: Religion can, of course, be irrelevant and often is. No human endeavor is immaculate, and one that traffics with millions is bound to emerge a mixed bag. In this respect religion is no different from other corporate enterprises — education which quickens and represses, government which orchestrates and restricts. Religion has been revolutionary and conservative, prophetic and priestly, catalytic and incubus. It creates barriers and levels them, raises church budgets and raises the oppressed, makes peace with iniquity and redeems, in part, the world. We acknowledge this mottled record right off for it would be a sad miscarriage of our Conference intent if in the act of assembling religion's delegates it were inadvertently to widen the gulf between them and their critics — between those for whom "religion" is a good word and those for whom it is not. No representatives from the Socialist nations are here. In view of their Marxist premise that religion is opiate this is not surprising, but it is none the less a lack. So to this absent third of the world we say: whereas the ecumenical movement's first phase sounded the potential unity among Christendom and its second phase is exploring the unity latent in religions, we look to a third phase that will seek the unity latent in man, the unity underlying the ideologies that divide him into secularist, socialist, religious, or by "isms" whatever.

* HUSTON SMITH is Professor of Philosophy at the Massachusetts Institute of Technology, Cambridge.

This paper was delivered by Dr. SMITH as the concluding address of the First Spiritual Summit Conference, Calcutta, October 1968.

WAAS-Series, Vol. VI.

PROCEEDINGS OF THE FIRST SPIRITUAL SUMMIT CONFERENCE,
CALCUTTA, OCTOBER 1968

Edited by STUART MUDD

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2. World Facts and Trends*

by JOHN McHALE et al.

Compiled by the Center for Integrative Studies, School of Advanced Technology, State University of New York, Binghamton, N.Y.

Director: DR. JOHN McHALE
Asst. to the Director: JAMES MACAULAY
Research Assistant: DAVID DiMARTINO

Advisory Committee

DR. BORIS PREGEL President,
American Division World Academy of Art and Science
Professor Harold Lasswell Chairman,
World University Council World Academy of Art and Science

From the Introductory Notes

This handbook has been compiled by the Center for Integrative Studies in collaboration with the American Division of the World Academy of Art and Science for use in the two related Conferences:

- (i) Nobel Symposium 14, held in Stockholm, Sweden, from September 15-20, 1969 under the title: "The Place of Value in a World of Facts".
- (ii) International Joint Conference of the American Geographical Society and the World Academy of Art and Science, to be held in New York, New York, from April 27 — May 2, 1970 under the title: "Environment and Society in Transition: Scientific Development: Social Consequences: Policy Implications."

This book attempts to provide a collection of charts and tables arranged for ease of reference in discussion of the major themes of both conferences. It is not intended as an exhaustive compilation of such materials but presents rather a basic set of working notes which may be adapted, augmented, and expanded as discussion proceeds.

* Remark by H.B.: A great wealth of information is compiled in this book by Dr. JOHN McHALE and his coworkers by means of numerous Graphs and Tables. All data are based on official documents and authentic works enumerated in an extensive List of References.

This handbook "World Facts and Trends", together with McHALE's former works, constitutes an invaluable contribution to the discussions to be held in the April Conference 1970 in order to bring about an overall cooperation towards solving the vital problems, mankind is now confronted with.

The Content comprises the most important data of:

The Biosphere (The Biomass concept, the Global Ecosystem); the Environ Systems (Atmospheric, Terrestrial, Marine); the Human Systems (Biophysical Psychological, Technological, Comparative Indicators); and a List of References.

Meetings, Conferences

(1) Executive Committee Meetings in 1969

During the year 1969 Meetings of the Executive Committee were in January, April, June and September. The main items were the development of the World University, the participation in the Nobel Symposium in Stockholm (September 1969) and the preparatory work for the complementary Conference "Environment and Society in Transition" "Scientific Developments: Social Consequences: Policy Implication" in April 1970 in New York.

More than 20 Units of the World University have been agreed upon and the Executive Committee, under the Chairmanship of Professor Harold D. Lasswell, Yale University, Conn., is now dealing with the details. The budget allotted to the World University for organizational purposes in 1969 was \$150,000, but huge sums will be needed to achieve the real aims: Supporting its own Working Units and fostering the work of other connected institutes of higher learning in a global cooperative effort to secure the threatened survival of mankind.

However, the sums necessary for our disseminated World University are, compared with the needs of other universities, surprisingly small. These first Units constitute, as a start, transnational Centres distributed throughout 17 countries in three continents.

The same sum which is necessary for the erection and maintenance of one single University Campus, would be sufficient in *our* scheme to bring one hundred universities into a close, and even a coordinated cooperation, in order to work out solutions of the specific vital problems connected with the world crisis, by "World Task Forces."

This Symposium was organized by the Nobel Foundation and held in Stockholm in September 1969.

Forty two scholars of worldwide renown, among them 14 Fellows of the World Academy, discussed "The Place of Value in a World of Facts". The participants represented a broad variety of disciplines, including also those of the Arts.

The participating Fellows of the World Academy were:

- C. A. DOXIADIS, Greece (Architecture, ekistics)
- C.-G. HEDEN, Sweden (Bioengineering, Organizing Committee)
- O. KLINEBERG, Canada, (Psychology)
- H. D. LASSWELL, USA (Law, social science)
- I. MALEK, Czechoslovakia (Microbiology)
- J. McHALE, USA (Futurology, observer for WAAS)
- MARGARET MEAD, USA (Cultural anthropology)
- G. MYRDAL, Sweden (International affairs)
- S. NILSSON, Sweden (Physics, Secretary-General Organizing Committee)
- L. C. PAULING, USA (Chemistry, peace)
- B. PREGEL, USA (Applied physics)
- T. SEGERSTEDT, Sweden (Sociology)
- A. TISELIUS, Sweden (Bio-chemistry, Chairman Organizing Committee)
- C. H. WADDINGTON, Scotland (Genetics)

A short extract from the Report to the Nobel Foundation written by the reporting group appointed by the Organizing Committee, is presented below:

"A human society without a system of values shared by its members is highly unstable, but conflicting values operate in our worlds, and impede progress towards a global society. In addition to ideological differences the basis of traditional value systems is shaken by the discoveries of modern science, especially in biology, and by technological change".

In particular "one of the greatest threats to human survival is the supremacy of the national ideal, at a time when advances in transport and communications have unified the world in a practical sense."

One of the moral responsibilities now falling heavily upon men and women of learning is that of strenuously cultivating in practical affairs, the international ideal already present in science.

The conspicuous problems relating to human welfare and survival include armaments, poverty, overpopulation, oppression, waste of resources, pollution, cities unfit for people, and the unthinking introduction of new technologies.

Confronting these problems, knowledge is the greatest form of capital.

Concerted intellectual leadership is needed for our technological civilization. Experts must identify and publicize foreseeable social consequences of innovations.

Not only techniques, but also the values underlying education, need thorough reappraisal. An aspect of knowledge that merits much greater emphasis in education is the ecological view of man in nature.

Opportunities exist in the world of learning for cultivating the international idea, in particular by institutionalizing the existing exchange between leading academic centres in the conception of a World University. Such a network would emphasize interdisciplinary opportunities and concern for social implications and priorities.

Because of their special knowledge, responsibility falls on scientists and other experts in the rich countries to lead political and public opinion towards urgent dedication of resources to world development. *Sagesse oblige.*

The concept of the disseminated World University as it is now in formation by WAAS was brought forward at this symposium by our Fellows Harold Lasswell, John McHale and Boris Pregel. It found great acclamation because it constitutes a transgression from theoretical discussions into practical strategical steps. (See next paragraph).

(3) *Plenary Meeting and Conference, April 1970*

The fourth Plenary Meeting of the World Academy of Art and Science will be convened in connection with the International Conference on "Environment and Society in Transition — Scientific Developments: Social Consequences: Policy Implications", jointly organized by the American Geographical Society and the American Division of WAAS. The Conference will take place from the 27th of April to the 2nd of May on the premises of the New York Academy of Sciences.

Apart from the reports of the work done up to now and of discussing the complex vital problems themselves, practical steps for a coordinated work on global planning, a strategy of action, and the manysided tasks of the disseminated World University will be dealt with in this connection.

One of the organizational tasks of the Plenary Meeting will be the election of the new President or Presidents of WAAS and of the World University and their new Board and Council Members.

Details will be given in a Circular Letter in the near future.

(4) *Group Meeting in Arizona, June 1969*

An invitation to lecture at the International Conference on Arid Lands at the University of Arizona in Tucson in July 1969 gave the President of WAAS, Dr. HUGO BOYKO, and Dr. ELISABETH BOYKO the opportunity to report on their work of desert reclamation and also on the work of the World University Units of Saline Irrigation and Water Purification, coordinated by him.

Since eleven Fellows of WAAS participated in this important Conference, HUGO BOYKO convened, with the permission of the Organization Committee, a Group Meeting to which also a few guests were invited.

Apart from the President of the University of Arizona, Professor RICHARD A. HARVILL, and Professor JAMES H. ZUMBERGE, who are now Fellows of WAAS, the following Fellows were in Tucson at that time:

HUGO BOYKO	President of WAAS and its World University	
ELISABETH BOYKO		Israel
JOHN CLOUDSLEY-THOMPSON	University of Khartoum	Sudan
VICTOR KOVDA	Academy of Sciences of USSR, Moscow	U.S.S.R.
W. G. MCGINNIES	University of Arizona	U.S.A.
JOHN PHILLIPS	University of Natal	South Africa
GILBERT WHITE	President, University of Chicago	U.S.A.

Guests invited to the Group Meeting were:

R. P. CHATELANAT	FAO (Rome)	(New Zealand)
M. EVENARI	Hebrew University	Israel
A. R. KASSANDER	University of Arizona	U.S.A.
M. KASSAS	University of Cairo	Egypt
M. P. PETROV	University of Leningrad	U.S.S.R.
R. S. RAO	University of Poona	India
R. W. RICHARDSON, Jr.	Rockefeller Foundation	U.S.A.
A. SASSON	University of Morocco	Morocco
TEHAH L. SMILEY	University of Arizona	U.S.A.

The main Speakers at this Group Meeting were: Dr. H. BOYKO, Israel, Academician Professor V. A. KOVDA, U.S.S.R., Professor J. V. PHILLIPS, South Africa, and Dr. W. G. MCGINNIES as Chairman.

H. BOYKO gave an account about the aims and the structure of WAAS, reviewed the activities up to now (Plenary Meetings, Symposia, Publications,

Advisory Activities, etc.), and outlined the framework of the World University under the leadership of Professor Harold Lasswell of Yale University. A number of questions on details answered by H. Boyko proved of very great interest to all.

The intensive interest of the participants was enhanced by the extempore speeches by Professors KOVDA, MCGINNIES, and PHILLIPS, particularly since these speakers come from diametrically opposite political backgrounds. All of them are highly representative personalities of their countries and well known to all. Their impressive speeches, together with the composition and the spirit of the small assembly itself, showed better than anything else the truly transnational structure on which WAAS is based.

Extract of the speech held by Academician V. A. KOVDA (U.S.S.R.), Scientific Secretary of the United Nations Advisory Committee on the Application of Science and Technology to Development:

As former Director of the UNESCO's Department of Natural Resources and now as Secretary of the United Nations Committee on Science and Technology, I was in touch with Dr. Boyko's aims and ideas for the very important scheme of WAAS at the beginning.

In fact, I had conceived similar thoughts and ideas which would enable a wider-embracing plan for mankind's future myself, and once spoke about this to Dr. Pregel. He, however, told me then that I was too late to create such a body because WAAS was already functioning as such, and shortly after this I was honoured by being invited to be a Fellow of WAAS by Dr. Boyko, whose important work in his own scientific field I have been familiar with for many years.

The concept of WAAS is to include every scientist, independent of colour, race and creed into one complete body. These aims are both humanitarian and scientific, and well enable WAAS to be an Advisory Body of highest competence and is complementary to the work of the United Nations and such other corporations. The concept of WAAS is unique and truly great.

However, even though moral and financial independence is a most important point in order to execute the ideas and statutes of WAAS and the WU, we should not underestimate the value of such support by the United Nations. Cooperation with this Body could be of great value in the future.

I am happy and honoured to be one of the Fellows and partners in this select group of scientists.

The President of WAAS was invited to attend the XIX Meeting of Nobel Laureates in Medicine in Lindau a/Bodensee, Bavaria, West Germany, in July.

Seven Fellows of WAAS (HUGO BOYKO, ELISABETH BOYKO, ADOLF BUTENANDT, Sir JOHN ECCLES, GEORG GRAUE, ALBERT SZENT-GYORGYI and HUGO THEORELL) and at that time the still prospective Fellows (ALBERT DE LAUNEY of the Pasteur Institute in Paris, Eng. MAX HIMMELHEBER, The Nobel Laureate Dickinson W. RICHARDS and Professor H. SCHAEFER were among the participants. Also present was Dr. MAGDA SRAUDINGER, Chairman of the Unesco-Commission of West Germany and widow of the Nobel Laureate Hermann Staudinger, who accepted the nomination to become a Fellow of WAAS but died before the final election.

Informal meetings with these participants and with others were used for discussions on WAAS and on the World University, and for an exchange of mutual information.

The meeting there with CARDINAL KOENIG and Engineer MAX HIMMELHEBER led to the steps mentioned in the Transnational Forum of this issue and to the connection with Professor Dr. H. SCHAEFER of the University of Heidelberg. Professor SCHAEFER, himself a Physiologist, is President of the German Society for Responsibility in Science and also President of the German Section of the Paulus-Society, which Section includes 500 University Professors of Theology of various Christian denominations, and also of other disciplines. The Paulus Society has aimed for 20 years to bridge the gap between Theology and Natural Sciences and also to bridge the gap between East and West.

In Lindau, details were also discussed between HUGO BOYKO as Coordinator for Saline Irrigation and Biological Water Purification with the two leading Scientists in the new field of water purification by higher plant species (cormophyta) Kathe Seidel of the Max-Planck-Gesellschaft and Reinhold Kickuth of the University of Göttingen. Close and coordinated cooperation within the framework of the World University was agreed upon as an important step against the global danger of pollution.

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Membership News

1. Newly Elected Fellows

Professor ADOLF F. J. BUTENANDT; President, Max-Planck Gesellschaft, Nobel Laureate (in Chemistry 1939). Munchen, West Germany.

General WILLIAM H. DRAPER Jr.; Economist, Hon. LL.D. of several Universities; U.S. National Chairman, Population Crisis Committee. Palo Alto, California.

Professor RICHARD A. HARVILL; Economist; President, University of Arizona; Member, Advisory Board of the Institute of World Affairs. Tucson, Arizona.

Professor BASIL S. HETZEL; Professor of Social and Preventive Medicine, Monash University, Victoria, Australia.

Professor EDWIN B. HUTCHINS; Professor of Psychology, Iowa State University and Director, Research Office of the Vice-President for Student Affairs; Vice-President, Ideal Development Corporation. Ames, Iowa.

Professor DICKINSON W. RICHARDS; Nobel Laureate (in Medicine and Physiology, 1956); Editor "Men and Ideas". Lakeville, Conn.

Professor JAMES H. ZUMBERGE; Professor of Geology and Director, School of Earth Sciences, University of Arizona; fr. President Grand Valley State College, Michigan. Tucson, Arizona.

2. Proposed New Fellows

Dipl. Eng. MAX HIMMELHEBER; Industrial Engineer and Philosopher.
Address: Baiersbronn, West Germany.

Professor Dr. HANS SCHAEFER; Head, I. Physiol. Institute, University of Heidelberg; President, Society for Responsibility in Science.

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Office of the President:

1 Ruppin Street, Rehovot, Israel, P.O.B. 534, Telephone 95 15 33
Cable Address: WAAS REHOVOT

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Bankers: The Chase Manhattan Bank, New York

Price for Non-Fellows and Non-Members US\$0.75 per number

EDITED AND PUBLISHED BY THE WORLD ACADEMY OF ART AND SCIENCE,
OFFICE OF THE PRESIDENT

Permission to publish extracts from this issue is granted, provided the customary
acknowledgment is made

PRINTED AT THE MOSHE SHOHAM PRESS LTD., TEL AVIV