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1947

Raymond B. FOsdick

During 1947 the appropriations of The Rockefeller Foundation amounted to $23,413,615. This figure, exceeding by nearly $4,000,000 the Figure of 1946, represents the largest annual amount appropriated in the 35 years of Foundation history. Included in the 1947 total is a single grant of $ 10,000,000 to the China Medical Board, Inc., for the support of the Peiping Union Medical College. The income of the Foundation from investments during 1947 was $10,011,756. This income was supplemented by a balance of $221,431 remaining from the previous year, by lapses and refunds from previous years amounting to $876,448 and by a transfer from the Principal Fund of$20,000,000.

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## CHALLENGE AND RESPONSE

All centuries are dangerous, said Professor Whitehead; and he added: "It is the business of the future to be dangerous." This was written in 1925, and certainly, there can be no question of the accuracy of the prognosis as it applies to our generation. The challenge of today's crisis is the most commanding which Western society has ever faced. We have always known that knowledge was a perilous possession because it could equally well work in the wrong direction; but the knowledge that has been placed in the hands of this age is so supremely capable of misuse — and misuse could so easily reduce the hopes and monuments of men to drifting dust — that the impact of the challenge finds us confused, uncertain and fearful.

Like all frightened people everywhere and in all ages, our first reaction is physical force, and our instinctive faith is given to military power. Let us grant at once that in this unprecedented crisis a measure of physical force is essential. We do not live in a Utopia, and it would be suicidal to act as if we did. Equally suicidal, however, is the assumption that the crisis can be met solely on the level of force, or that mechanisms, power and dollars constitute the essential elements of the solution.

The present is one of the supreme moments of challenge, in which, as Toynbee says, the character of our response determines the chances of survival. The past is littered with the wreckage of nations and empires which tried to meet the crises of their times by physical means alone. Our response today cannot be confined to this lower level. Unless we can rise to greatness and lift our answers to an intellectual and ethical plane, our fate will be the fate, not only of the nations that preceded us in history, but of all species, whether birds or brontosaurs, which specialized in methods of violence or defensive armor.

One of the difficulties in putting our response on a higher level of human searching is our emphasis here in America on the task of raising the material standards of living. In this ambition we have been incomparably successful; our productive and consuming capacity is greater than that of any other country in the world.

But the result is that our principal standards are standards of quantity: we have more of everything than anybody else — automobiles, refrigerators, radios, railroads. Consequently our vision is not so much of a world peopled by wise and honorable men as it is of a world in which "every family has its automobile and every pot its chicken." We have too easily made the assumption that other values would automatically follow our material well-being, that out of our assembly lines and gadgets the good life would spontaneously be born.

One of our leaders recently said that Europe could prosper in the long run only as she adopted what he called the American philosophy of consumption. This uncritical identification of consumption with social value is, of course, not characteristic of this country alone or of this age alone; but the extent of the confusion in America today is disquieting. Although our religion and ethics have long tried to enlighten us, many of us are still only dimly aware that purchasing power is not the measure of a great society, and that wisdom and cultural values are not the inevitable consequences of an increased capacity to consume.

It is, of course, obvious that a solid material foundation is an essential basis for a high civilization; but it is a basis, not a superstructure. Our tendency is to confuse one with the other, to mistake the foundations for the towers and turrets of the new city. There is a spiritual hunger in the world today that is not being satisfied by American exports. "God knows we need food and coal to survive," said a European delegate to Lake Success, "but unless America can take the lead in providing a vital faith, in giving us a song that mankind can sing, all her exports will merely postpone the day of reckoning, and the world will die anyway."

Another aspect of the difficulty which we face in placing on a higher level our response to the challenge of our time, is our superstitious reverence for the physical sciences. They have become sacrosanct — the dispensers of the gifts of life. The doctrine that "civilization can be bred to greatness and splendor by science” is widely accepted. Even our universities have succumbed to this twentieth century worship of methods which give mastery in the physical world. In contrast with the money available for the humanities and the social studies, far greater sums are today being allocated to the physical sciences by our educational institutions than ever before. From government and business, as well as from college budgets, money in increasing amounts is being poured into the teaching of chemistry and physics. "This is the Century of Science,” one characteristic college announcement proclaims, "and we must orient our students to the prevailing interest of their time.” A prominent eastern university reports its enlarging plans with these words: "In the face of the increasing impact of science on our society it is widely agreed that an essential aim of general education is to impart to the university undergraduate an appreciation of the methods of the sciences.” Of course, a decent obeisance is always made in the direction of the humanities and the social studies. The fact remains, however, that in terms of endowment, research facilities and teaching staffs, these studies are far outdistanced by the physical sciences, and the gap is growing wider.

But the gap should be closed rather than widened. We cannot escape the obligation, in this scientific age, to comprehend science; but in the supreme question which faces our generation, physics and chemistry and engineering have no answers for us. They are ethically neutral. They are preoccupied with physical matter.

They can give us more horsepower; only the naive, however, will claim that horsepower can develop within itself the means by which our runaway technologies can be brought under control. They can help more men to better health and longer life; but they have little relationship to the problem of discovering a new set of human purposes, or to the art of human relations, or to the winning of social1 and moral wisdom, upon which peace and successful government depend.

It is scarcely necessary to acknowledge our vast indebtedness to science in giving us the methods and patterns of research in human relationships. Every contribution of science to the problems of society is to be welcomed. But the enlightenment of science is bringing with it a tendency to reject the limitations of science.

To expect that exact measurement and exhaustive definition will relieve us of the necessity of ethical inquiry, or that the meaning and values of human life will somehow or other crystallize as physics crystallized around the concepts of mass and energy, is a form of superstition as deadly as any we have known.

The issues of our time and of human destiny will be determined, not at the physical, but at the ethical and social level. Material power and dollars and military ascendancy may preserve us temporarily; but the dynamic tensions of our society can be relieved only by moral and social wisdom, and that kind of wisdom cannot be precipitated in a test tube nor can it be won by the brilliant processes of nuclear physics.

In the same essay which was quoted at the beginning of this section, Professor Whitehead went on to say: "It must be admitted that there is a degree of instability which is inconsistent with civilization. But on the whole, the great ages have been the unstable ages.”

This is the ray of hope that lightens the darkness of the present hour. It is not in times of security that men build a Chartres Cathedral or write a Hamlet or push their boats across an unknown ocean to discover a new continent. Oddly enough these achievements occur in years of instability.

Danger and hazard mark our age today. But in Professor Whitehead's phrase, it can be a great age, like other ages that have been born out of fear and challenge. Its greatness, however, if achieved, will consist in its search for an enlightened humanism and for rational and ethical values that will rise above our time as the spires of Chartres rose above the twelfth century.

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## The immediate task and the ultimate goal

In 1947 representatives of The Rockefeller Foundation visited practically every country in the world with the exception of Bulgaria and the Soviet Union. Visas to enter those two countries could not be obtained, nor was it possible to establish contact with their scholars and scientists. The conflict of ideologies — what Gibbon called "the exquisite rancor of theological hatred" — divides the world today in bitter partisanship, just as Europe was divided by its religious wars of the sixteenth century. As a matter of fact, ideologies have always divided mankind; the rifts are centuries old; there has never been one world. What we are attempting today is something that has never in recorded history been accomplished. We have barely begun on what is unquestionably the noblest as well as the most discouraging task which statesmen and nations have ever undertaken.

If the aim were to iron out all the differences which exist among men — to achieve a Utopia of unruffled unanimities — it would be fatuous even to begin it. The world of the future — if any world survives — will be a world of diversity, held together by a conception of common interests. It will be a world in which many political faiths and economic creeds are tolerated and widely differing points of view fertilize each other for the common good.

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Our challenge in this generation is to discover the common interests, the terrain of possible collaboration, the overlapping areas of curiosity and sympathy, of aspiration and mutual advantage, that bind the human race together regardless of ideologies or boundary lines. The search for these rallying points of unity, the development of new techniques and areas of cooperative action where ideas and experience can be pooled and combined — this is the immediate task; this comes first; this is the foundation of the ultimate structure of a united society.

The activities of the World Health Organization of the United Nations furnish a pertinent illustration; for health is something that all men desire and there is no limited supply for which nations must compete. Public health work carries no threat to anybody, anywhere. Cancer and scarlet fever have no political ideology. There is no Marxian method of eliminating gambiae mosquitoes as distinguished from a Western democratic method. The principles of sanitary engineering do not bear a Russian or an America label. No difference exists beween tuberculosis in the Soviet Union and tuberculosis in the United States. Infantile paralysis is the same thing in Moscow and in Washington, and human sorrow is no less poignant in one city than in the other. The world of disease and misery is not divided; it is a common world. In terms of human suffering the world is truly and tragically one world.

What is true of medicine and public health is true also in the fields of science and humanism. There are no French or English enzymes, no German or American electrons. The second law of thermodynamics is not the property of any group or nation. Tolstoy and Shakespeare and Beethoven and Tschaikowsky belong to the world, just as the spiritual ideals of Gandhi have now become the heritage of mankind. These are some of the common interests whose waves are breaking over the old flag-marked boundaries and are bringing to the world a conception of civilization and of the intellectual life of man as a cooperative achievement.

In spite of all evidence to the contrary the things that divide the world are trivial as compared with the things that unite it. The mutualities of human beings everywhere far exceed their divergencies. In all the countries which representatives of the Foundation have visited over these recent years, one outstanding fact has emerged: the people are dominated by a passionate hope for peace, security and a better life. They seek a world in which men may grow in strength and dignity. They want no world in which war periodically tears to pieces the bright promise of the future. That is the pattern of thinking and planning everywhere. Men differ as to the means by which these ends are to be secured, but as to the goal itself there is little diversity of opinion.

This substantial unanimity of aim, sharpened and oriented in our time to a new point, is at least a gleam of hope in a dark age. Mankind is conscious as never before of common roots and common potentialities, of common basic desires and appetites and the c o m m o n skills required for their satisfaction. A recognition of kinship exists which wars and clashing ideologies can blur but cannot eliminate. Slowly but perceptibly there is developing a conception of the intermeshed interests of men, of the universality of human need, of the single destiny that awaits life on this planet, whether it be good or evil. This is the principle that lies behind the United Nations, the incentive that gives moral and intellectual greatness to the work of this generation in clearing the ground for the new advance.

## European Laboratories and Isolation

Since V-J Day The Rockefeller Foundation has appropriated $5,584,469 for various activities in the war-crippled countries of Europe. The aim has been twofold: first, to get research started again by providing equipment or support to a few of the universities, libraries and research centers; and second, through conferences and aid in procurement of scholarly journals, to reestablish the contacts of these institutions with each other and with the rest of the world. All five divisions of the Foundation have participated in this effort, i.e., Natural Sciences, Medical Sciences, Humanities, Social Sciences and Public Health. The largest grants were made in Great Britain, France, Denmark, Holland, Norway, Sweden and Switzerland, with smaller grants in nine other countries.

It is easy to exaggerate the significance of what has been accomplished. One has only to see the vast, unanswered needs in the way of buildings, books, periodicals and equipment to realize the utter inadequacy of a sum like $5,000,000 in restoring Europe to anything approaching its former place in the intellectual life of the world. The situation is far beyond the capacity of private funds. In scattered locations such funds can ameliorate some of the difficulties, but the need is so universal and so overwhelming that it can be met only by governments or international agencies. Often the sums required are relatively small — a few dollars for chemicals to continue some piece of laboratory work, or two or three hundred dollars for essential equipment, or money for books and periodicals to enable a particular scientist or scholar to discover what his colleagues in other countries have been doing, or for an opportunity for him to consult with them in their universities and laboratories. But the aggregate of such sums is formidable, and a private agency with limited funds can do hardly more than palliate the evil. Moreover, palliation may be an evil in itself. To the extent that it lessens the difficulty, it tends to lessen the responsibility where the real responsibility undoubtedly rests: on governments and on the international agencies concerned.

(…)

The point cannot be too often stressed that the health of the intellectual life of the world depends upon the free and unhampered exchange of ideas and personnel between universities and research institutions in all countries. Scientific growth is almost invariably the result of cross-fertilization between laboratories and groups in widely separated parts of the world. Achievement, more often than not, is the result of the sustained thinking of many minds in many countries driving toward a common goal. The creative spirit of man cannot successfully be localized or nationalized. Ideas are starved when they are fenced in behind frontiers, and barricaded research in the long run can result in intellectual stagnation.

This is why the heavy concentration in the United States of research in atomic physics is unfortunate. The grim necessities of security seem for the time being to make any other course impossible, but we must face the fact that from the standpoint of the growth of knowledge, it is an unhealthy arrangement. All knowledge is so interlocked that we cannot control research on the destructive aspects of atomic energy without at the same time interfering with world-wide research on its beneficent possibilities. In the harnessing offerees which may bring incalculable benefit to mankind, knowledge is retarded through Jack of cross-fertilization, and. the advance into the unknown runs the risk of being slowed down because the intellectual air is too thin to breathe.

In the history of modern science no single country by itself has ever had the intellectual resources or the imagination to bring to full fruition all the potentialities of a new idea. Equally unfortunate is the growing isolation of the scientists and scholars of Eastern Europe.

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## The problem of Germany

On the assumption that Germany is allowed to regain a considerable measure of productivity, there would seem to be at least two prerequisites essential to the development of a democratic society. The first is the restoration of communication between the Germans and the people of other countries. The wall of isolation which has tended to make Germany one vast prison must be thrown down, and ways must be opened for the free flow of ideas, through books and journals, films, radio and works of art, and through the interchange of personnel in various types of activities. The second prerequisite is the development of younger leaders who know the world outside of Germany. Young men and women from the universities, labor unions, youth organizations, newspapers, churches and industries must breathe the air of other countries and learn how people in those countries live and think.

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## Medicine in China

Over 40 years ago, in a lecture at Stanford University, William James said that a college should be a place of "intellectual ferment." That phrase describes with vivid accuracy the institution in Peiping, During the period of its operation Jess than ten of its more than 300 graduates went into private practice; all the others were absorbed in medical teaching posts or governmental medical positions. They had been exposed to an intellectual ferment and they had a new gospel to preach across the length and breadth of China. It was the gospel of modern medicine and the conception of what it could do for the millions of people who had never known it. Today six of the national medical schools of China are under the leadership of graduates of the Peiping institution, and six other medical schools are headed by individuals who, although not graduates of the college, spent many years as members of its staff.

It may seem an odd moment in the history of the world, and particularly in the history of China, to make a fresh investment in the development of modern medicine in that unhappy country. But medicine, as we have already pointed out, is not a matter of political ideologies or flags or marching armies. It is interesting to note that the graduates of the Peiping Union Medical College are serving the populations on both sides in the tragic war that is now decimating China.

They are bringing their healing techniques not only to needy men and women but in a deeper sense to a human society hat is desperately sick. In dark hours like these it takes perhaps a leap of faith to believe that medicine can be one of the bridges across the gulf that separates this frightened present from a saner and better-balanced future. We shall, of course, need other bridges, but modern medicine, bringing us a conception of common human need that overrides our irrational and suicidal differences, can surely help.

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## The Widening horizons of public health

In no area of knowledge and practice are changes occurring more rapidly than in medicine and public health. We seem to be on the threshold of an era more promising than any we have known. The sulfonamides, penicillin, radioactive isotopes, DDT — to mention only a few new instruments which have been placed in our hands — foreshadow a new move forward, a new renaissance, a new period in human development when the imagination is endowed with wings. If only we can be freed from the shrieking insanity of another war, it does not seem impossible to believe that within a period of no unreasonable duration we shall be able to limit the ravages of diseases like cancer, tuberculosis, infantile paralysis and perhaps some of the degenerative disorders and even the common cold.

But the advance is not only in curative medicine; it involves the relations of medicine and public health to each other, and their place and scope in the social structure. There are strong evidences, for example, that the border lines between curative and preventive medicine are fading out. Public health has been concerned primarily with its traditional preventive work, on the general theory that "a fence at the top of the cliff is better than a hospital at the bottom." But diagnostic and curative medicine cannot avoid preventive measures any more than preventive medicine, under certain circumstances, can stay out of the curative field. We have the phenomena now of public health personnel running hospitals (for the very good reason that if they did not run them, nobody else would) and of practitioners, in fields like obstetrics and pediatrics, moving openly and boldly over to the preventive side. It works both ways, and substantial experience as well as practical demonstrations are accumulating, particularly in the English- speaking and Scandinavian countries, which show how the old lines are breaking down. Certainly the attempt to fix the boundaries of public health by establishing a rigid distinction between prevention and cure is no longer realistic.

To what ultimate goals this trend is leading no one can do more than guess; but one aspect of the problem is intimately related to the economics and sociology of medical care. (…) His report showed a world-wide trend toward a far broader distribution of the benefits of modern medicine than has hitherto, at least in the United States, been thought practicable. The economic barriers to adequate medical care, which previous generations have tolerated as a necessary evil, now lie heavily upon the consciences of people everywhere. It is inconceivable that complete preventive, diagnostic and curative services should, for any individuals or groups, be determined by financial status rather than by actual need. No nation that values the worth built into its human population can continue to allow its citizens to die, or for that matter to be only half alive, solely because they are unable to pay for what modern medicine could give them. Health is a basic human need, and in all the countries visited by Dr. Grant steps are being taken, with varying degrees of thoroughness and success, toward a program of curative and preventive measures which will make available to every individual, without discrimination, all the facilities of modern science necessary to the development and maintenance of his mental and physical capacity.

Public health is thus reaching the stature of a social science in the service of society. It has its roots deep in the general welfare. It embraces fields like nutrition, housing, recreation, education and social security. It is an integral part of the social process.

This point of view represents a radical departure from American thinking of even two decades ago. But our democracy is not static; it is a vigorous and growing faith. The American tradition has always been a tradition of experimentation.

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## The education of nurses

his interest has been related primarily to the Foundation's program in public health, and for that reason its emphasis has been placed on the preventive and social aspects of nursing rather than on the strictly curative side. In other words, the Foundation has been concerned not so much with the training of the hospital or bedside nurse as with the development of young people for community nursing service, But both types of nursing are essential, and both should stem from the same basic pattern of education. True, many routine bedside duties may in the future be discharged by some other sort of personnel provided by short training courses specifically designed for this important task. But overall responsibility for nursing care can only be assumed by those whose education is unequivocally professional.

The public health nurse has come into her own. In point of numbers she far exceeds other health workers. Upon her, in large measure, the practice of public health depends. Health work succeeds or fails as the public health nursing services are good or poor.

(…)

Important as the capital projects are, it is recognized that buildings are not the vital part of any program; rather, it is the people who put the program into operation that really count. The Foundation has emphasized from the beginning that the proper preparation of teachers, supervisors and administrators for their posts of responsibility in the training of nurses is of paramount importance. An extensive fellowship and travel grant program has, therefore, been in operation for nearly a quarter of a century, bringing from one country to another, from one institution to a particular key center, the leaders of the nursing profession who could most profit by such an experience.

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## The cross breeding of biology

Over the last two decades The Rockefeller Foundation has, in the field of the natural sciences, put its main emphasis on experimental biology, and particularly on the application of the techniques of the physical sciences to the problems of living matter. Just as the corn breeder obtains greater vigor and larger yield by making hybrid crosses of different lines, so in science new strength and gratifying new results can be obtained by joining two different disciplines. In terms of this analogy, the Foundation's program has been engaged in sponsoring marriages between the physical and the biological sciences. These are by no means new alliances.

The history of such unions can be traced over hundreds of years. Nevertheless, experimental biology, as it exists in the laboratories of today, is a surprisingly young subject. Of the hybrid crosses that have occurred in the development of modern biological research, the first was between chemistry and biology. During the last half-century this union has helped to unlock the secrets of plant and animal nutrition, of vitamins and of hormones, and more recently of enzymes. It has given us the methods, the skills and the insight to pursue these studies down to the level of the living cell. Today, with such development as virus research and chemical genetics, it is pushing our knowledge to a point where we are dealing with the intimate details of those basic processes which characterize life itself.

Within the last few decades, the cross between biology and physics has firmly established itself as a fit companion for biochemistry, and this newer union promises equally large and significant returns. Biology no longer confines itself to organs, tissues or even to cells. It has reached a molecular level; and we speak, in an atomic age, of the infinitely little things that have become visible with the electron microscope, or that can be separated by the terrible forces of the ultracentrifuge, or that can be surmised from the images they cast on an X-ray crystallographer's plate. Indispensable as the optical microscope remains in biology, it is no longer the predominant tool that it was only a quarter of a century ago. The modern biological laboratory often looks surprisingly like a chemical or physical laboratory.

The frontier of biological knowledge has penetrated beyond the limits set by the optical microscope and is now located out in that strange world of individual molecules, previously invaded only by the physicist and chemist.

Each new hybrid cross in science has given rise to, or has developed out of, an ever increasingly complex array of scientific tools and techniques. As experimental biology outdistances the limits of any one discipline, so, too, it outdistances the financial limits of its former laboratories. The institutes which can afford ultracentrifuges, X-ray equipment, vast computers, spectrophotometers, electrophoretic machines and cyclotrons are not numerous; and we may soon see the beginnings of another hybridization, at the institutional level. Indeed, it has already begun, for we are witnessing the development of specialized centers for enzyme study or for virology or for protein research, and cross-fertilization between these centers is an obvious necessity.

This development toward specialization could take an unfortunate turn if it entrenched itself behind the frontiers of nationalism, thus defeating the possibility of general cross-fertilization. Specialization by countries in a world in which the free international exchange of men and ideas had been destroyed would be a calamity to the development not only of biological research, but of all research as well.

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## The Unity of Science

The fragmentation of knowledge into uncoordinated specialisms has long been recognized as one of the chief evils of modern scholarship. Few people can grasp or comprehend more than a small segment of the whole domain of learning, and attempts at integration and synthesis often result in superficiality. Liberal education in universities and colleges has, for example, too often consisted of exposure to an absurd collection of bits of knowledge held together by no visible thread of unity or coherence.

There is, of course, nothing new about this situation; it has been under discussion for more than a generation. But although many institutions are now reorganizing their courses of study in the interests of a greater unity, little has been done about the central core of the problem. Meanwhile, the irresistible advance of knowledge involves an equally irresistible increase in specialization.

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## The national Bureau of Economic research

In 1947 The Rockefeller Foundation made the largest grant it has ever made in the field of economics. The sum of $1,300,000 was appropriated to the National Bureau of Economic Research, extending support to that institution through 1954.

The National Bureau, which is now in its twenty-eighth year, and which has received support from Rockefeller boards since 1923, is one of the world's leading institutions that seeks to lay a more adequate foundation for objective thinking and research in economics. Beginning in 1920 with investigations of the amount and distribution of national income, the program of the bureau was gradually broadened to include studies in business cycles, employment, wages and prices. In the next two decades, investigation in production and productivity trends as well as in finance and fiscal policy was added. By entering new fields gradually and at the same time continuing work in old fields, following leads whenever results were promising, the various investigations constitute a significant beginning in the scientific measurement of the realities of economic change.

Dr. Wesley Mitchell, the leading spirit in the creation of the National Bureau, had a conception of research in economics that was daring and at the time perhaps somewhat unfashionable. This conception rested on two beliefs: (i) that the rich capacity of economists to produce imaginative hypotheses was not adequately balanced by efforts at verification and inductive research; (2) that with the facilities now available, it should be possible to supplement theoretical conjecture with scientifically measured fact and relation; and, thereby, to work towards the substitution of tested conclusion and definitely measured knowledge for guesswork and dogmatic hypothesis.

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## Approaches to peace

There is a sense, of course, in which the Foundation's entire program is aimed at the single target of world peace. Whether the work has to do with the control of malaria in Sardinia, or the extension of our knowledge of human behavior through research in psychiatry, or the promotion of the interchange of students of philosophy between North and South America, the objective is a humane and rational world in which peace among men can be secured. The preparation of the soil for a social order in which peace can permanently grow requires the maturing processes of time; and although many of us may doubt whether our civilization is going to be accorded this necessary factor of time, unless we take the completely defeatist attitude we have to proceed on the assumption that there is still going to be an opportunity for intelligence to take hold, and that the world of the future will still be a free world in which reason rather than force will control.

Meanwhile we cannot neglect the direct approach to the overwhelming crisis of our generation, and for its part the Foundation has contributed substantial sums over the last decade to organizations and projects that are concerned with the issues of international relations.

## P 41 The Humanities in Space

The humanist is no freer of the danger of parochialism than the scientist. Not only is he apt to be a prisoner of his own specialization, but far too frequently he is narrowly preoccupied with the culture of a limited segment of the world. Particularly here in our Western civilization we look back along the corridor from which our literature, history and philosophy have emerged, only dimly aware of other corridors that lead, like our own, into the vast amphitheater of blending cultures into which we have now come.

(…)

We are concerned today about a world organization, and we know that unless it can be made to succeed, the atomic age will ride in on a wave of senseless horror. But without a world view of human culture a world organization can scarcely survive. The building of world unity depends in large measure upon a humanism which, limited by no flags or boundary lines, embraces the contributions of men everywhere.

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## The Humanities in time

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THE Natural Sciences in 1947 continued its program of support to research work in the field of experimental biology. A considerable part of the aid went to men or groups investigating biological processes with techniques adapted from the physical and chemical sciences. A main purpose of these and similar investigations is to add to our knowledge of the structure and physiological activity of such basic substances as the proteins, enzymes, hormones and steroids, as well as the action of various bacteria and viruses.

Several grants went to projects in the Latin American countries. The largest, in the amount of §266,900, was for continued support of the Mexican Agricultural Program. Other aid to the development of agriculture went to the Faculties of Agronomy of the National University

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AGRICULTURAL ECONOMICS RESEARCH INSTITUTE p 188

A research project at the University of Oxford, supported by The Rockefeller Foundation in 1947 with a two-year appropriation of $28,350, emphasizes the interrelationships between agricultural and industrial activities, which have been often studied as though they constituted separate worlds. The work is under way in Oxford's Agricultural Economics Research Institute, under the directorship of Professor A. W. Ash by who, s head of the Bureau of Agricultural Economics at Aberystwyth in Wales, developed many of the best agricultural economists in Britain.

1942, puesta en marcha del Mexican Agricultural program

The Mexican Agricultural Program, set up five years ago following a Foundation-sponsored survey, is a cooperative enterprise known officially as the Oficina de Estudios Especiales, within the Mexican Secretariat of Agriculture. Basic aims of the program are to improve the volume and quality of staple food crops in Mexico and build up a team of Mexican agricultural scientists who will eventually take over all the experimental activities, Some 10 to 14 American staff members are provided by the Foundation to help in this work, and each year the Mexican Government assigns a large number of graduates of the National College of Agriculture in Chapingo to participate in the program.

Many of these move later into important agricultural posts in Mexico or go to the United States for further training. The program has also attracted a growing number of agriculturists from other schools in Mexico and from Colombia and the Central American countries.

Essentially the program is one of systematic re searches in specific agricultural problems of Mexico. As the economy of Mexico is predominantly agricultural, the program has considerable significance, not only as a scientific demonstration but also as a practical technique of cooperating in the improvement of a national economy. At present the program centers around crop improvement studies. In some 30 experimental plantings scattered all over the republic, Mexico's chief crops — corn, beans and wheat — are tested for yield and other characteristics. At the National College of Agriculture in Chapingo 225 acres are available for this purpose. Also concentrated here are studies of soil fertility, irrigation and the control of insects and of plant diseases. A commodious new building of brick and concrete was recently completed to house the laboratories, provide storage space for farm equipment, seeds, insecticides and other supplies, residential quarters for staff researchers and a field headquarters for the program, Administrative headquarters and the library, as well as some of the scientific laboratories, are located in Mexico City.

Notable progress has already been made in the seed improvement program. Corn, wheat, beans, sorghum,barley, oats, clover, vetch and forage grasses are tested and new varieties developed. As new varieties become available in the Chapingo experimental plantings, the seed is sent to regional planting sites for adaption to altitude, rainfall, soil and other peculiar regional conditions. Good varieties are then grown for seed increase.

Small land owners have shown a very active interest in the work, and a number have offered their farms for experimental purposes.

Mexico lives on corn, the Indian maize which has been growing in its valleys and along its mountainsides for thousands of years. Rich and poor eat this staple food, largely in the form of tortillas or thin pancakes made of finely ground corn. Occupying something like 58 per cent of the cultivated areas of Mexico, corn grows in a great variety of climates, all the way from sea level to altitudes of 10,000 feet, in all kinds of soil and moisture conditions. Unfortunately, the yield per acre has been low, perhaps 10 bushels as compared with 25 or more bushels per acre in the United States. In the effort to determine the best varieties for each set of regional conditions, 1,500 samples of native corn have been selected and tested. Fifteen have thus far proved superior, and one has given over a three-year period a yield 25 per cent better than the best hitherto grown in the Valley of Mexico. Although the immediate problem is to determine the best native variety for each region, the ultimate goal is to produce even better hybrid or synthetic varieties by crossing two or more types of the native corn. Some hybrids already obtained are 50 per cent better yielders than the best of native corn. Although not quite so satisfactory as hybrids, several good synthetic varieties have also been developed. As the seed of good varieties becomes available in quantity it is released to Mexican farmers for planting. Plantings of seven synthetic varieties are expected to provide sufficient seed to plant 450,000 acres in 1948. Improved varieties of wheat and beans will soon be available also. The distribution of seed is controlled by government maize commission which supervises allotments of seeds in the various regions and sees to it that the recommendations for planting and cultivating are observed.

In connection with testing operations, considerable attention is given to determining the resistance of natural or artificially obtained varieties to insect depredations and various diseases. Of outstanding importance also is soil management. Work in this domain includes chemical and physical studies of Mexican soils and experiments with crop rotations, fertilizers and irrigation methods. The present high cost of chemical fertilizers in Mexico keeps them beyond the reach of most farmers, but crop rotation and plantings of nitrogen-fixing legumes and grasses show promising results. Although little publicized, the success of the program is slowly but surely attracting attention from land owners, students, professors and some of the other government bureaus. The problem now is to translate research achievements into terms of immediate improvement of Mexican agriculture.

Continuing its support The Rockefeller Foundation allocated $266,900 to the Mexican Agricultural Program in 1947.