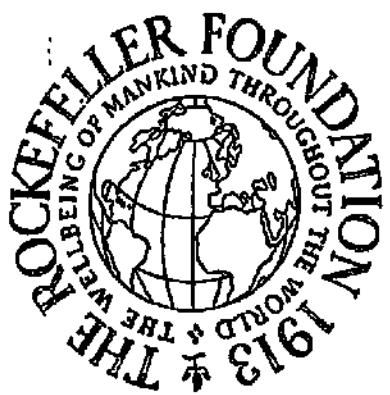


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<sup>1</sup> To July 31, 1957.

To the  
Trustees of The Rockefeller Foundation

Gentlemen:

I have the honor to transmit herewith a general review of the work of The Rockefeller Foundation for the year 1957, together with detailed reports of the Treasurer of the Foundation and of the Directors for Medical Education and Public Health, Biological and Medical Research, Agriculture, the Social Sciences, and the Humanities for the period January 1, 1957 to December 31, 1957.

Respectfully yours,  
Dean Rusk  
*President*



The  
President's Review  
1957



## Statistical Summary

The appropriations of The Rockefeller Foundation in 1957 reached a total of \$42,798,916.00. Included were grants in Medical Education and Public Health amounting to \$8,298,260.00; Biological and Medical Research received \$5,255,235.00. The Agricultural program of the Foundation was supported by \$5,621,400.00. Appropriations in the Social Sciences totaled \$3,570,525.00. In the general field of the Humanities \$3,373,670.00 was appropriated, and a closely related grant of \$7,500,000.00 was made to the Lincoln Center for the Performing Arts in New York City. Unclassified grants, including one of \$5,000,000 to the American University of Beirut, added \$6,466,710.00, and Administration and services required \$2,713,116.00.

During the year 532 persons from 53 countries held Rockefeller Foundation Fellowships, of whom 248 received awards during 1957. The holders of these Fellowships pursued their advanced training or research in 104 institutions in 20 countries.

The Foundation received \$23,297,131.98 of income during the year and reinforced its income account by a transfer of \$20,000,000.00 from capital funds to provide for its largest total of appropriations in any single year. Appropriations in 1957 brought the 45-year total to \$611,170,258.55; of this amount \$143,157,061.59 was taken from capital funds, the remainder from income. The market value of the Foundation's uncommitted capital fund on December 31, 1957, was \$492,365,671.17.

Grants of all types and for all purposes numbered 737 during the year. Approximately 4,950 formal applications were declined, in addition to a large number of informal inquiries.

## The Broadening Base of Cooperation

Dramatic headlines paint a picture of a world about us in which contending national policies and personalities dominate the scene. The analytical concept of a struggle for power has brilliantly illuminated turbulent events for students of international politics. An international political community, more than mere aspiration but less than effective reality, seeks with varying success to curb the dangers of collision among unruly national states. Many would find the crucial issue of the mid-twentieth century to be whether man is willing and able to adjust his politics to the imperative necessities of his technical knowledge and material power.

Fortunately, conflict is not the whole story; cooperation among governments has been steadily growing in scope and importance. The roster of agencies charged with building common action upon common interest is a long one. Tens of thousands of men and women of many nationalities, seldom noticed by the headlines, are busily engaged in eradicating malaria, improving basic food crops, protecting life at sea and in the air, expanding literacy, and stimulating intellectual exchange. Some of these agencies are world-wide, such as the great Specialized Agencies of the United Nations. Some are regional, like the arrangements for economic and cultural cooperation within the European community, the Colombo Plan, and the technical arms of the Organization of American States. Added to these are the even more numerous bilateral techniques through which governments traditionally have worked amicably at common concerns.

Cooperation among governments, though subject to interruption by major differences, does not depend upon political harmony, on an identity of interest, or on similarity of social systems. It rests upon identifiable, reciprocal, practical advantages. Cooperation belongs as much to the hard-headed realist as to the warm-hearted idealist. A nation's

own postal system is severely limited unless its mail can move readily to foreign destinations. Nations which oppose each other with great bitterness nevertheless join in an epidemiological reporting service. If politics can disrupt cooperation, it is equally true that habits of cooperation in everyday affairs lay a moderating and restraining hand upon political crisis. If present danger, therefore, lends urgency to the great issues of war and peace, prudence suggests that as much as possible be done to broaden and deepen the base of cooperation. Man at his best may thus find something worth while to say to man at his worst.

The work of The Rockefeller Foundation has brought it into close contact with intergovernmental cooperation at the local level in every continent. From what men do, as well as from what they say, one can not doubt that disease, hunger, and ignorance are everywhere looked upon as great affronts to human dignity. One senses that health, a decent livelihood, and education are common interests which help to transform contentious men into natural allies. If, in the shadow of terror, we are well advised to act at least in some particulars as homo sapiens, there are many opportunities.

Men have not yielded the entire spectrum of their lives to governments and governments have not, generally speaking, expected them to do so. In the half-seen background of international life are a variety of informal international communities, no less real for being only partially organized, which function with a minimum of attention to political boundaries and to the feverish events of the political arena. One thinks, for example, of the international communities of science and scholarship, of the arts, and of religion. One might add private travel, sports, and recreation. Even trade and commerce, though closely linked to national policies, has purposes and procedures of its own which insulate it to a degree from the political struggle. Lawyers, acting for private clients, effect adjustments across national frontiers and

spin the countless threads of accommodation which bind diverse legal systems to each other. Most of these informal and unofficial international communities antedate the modern national state. They have shown a rugged capacity to survive the most appalling military and political conflict and the widest differences in social and political systems.

For a half century Rockefeller boards have been intimately involved with what was called, above, the international community of science and scholarship. The Rockefeller Institute, the General Education Board, the Rockefeller Sanitary Commission, the International Education Board, the China Medical Board, and The Rockefeller Foundation have all played a part. Of these, the Foundation has played the largest role in the direct financial support of science and scholarship abroad. But the work of these boards in the United States, beginning at a time when Americans habitually turned to Europe for advanced scientific training and research, has helped American scientists and scholars to take useful and respected places in the larger community. Similarly, these boards have participated in the hospitality which American universities and research institutions have been privileged to offer to rapidly growing numbers of young scientists and scholars from abroad.

Many techniques have been used by The Rockefeller Foundation to support science and scholarship on an international basis. The universities are at the center of this great intellectual community and have received the greater part of the Foundation's resources. These funds have assisted with endowment, capital plant, and the increasingly complex instrumentation of the modern laboratory. Books for libraries and, more rarely, assistance for library buildings and equipment have been provided. Funds for research have supplied time free from other duties, research assistants, and materials. Help has been given for the more effective communication of results to interested scientists and scholars.

Travel funds encouraged personal contacts among men addressing themselves to common problems. Advisers have been made available to newer universities, medical and agricultural schools. Foundation officers and staff, moving regularly around the globe, have carried news of new developments and techniques from place to place. Research on selected problems has been conducted by the Foundation's staff in its own laboratories, or in cooperative laboratories and experiment stations abroad. Most important of all, perhaps, has been the Foundation's fellowship program, designed to provide additional experience outside his own country for the young scientist or scholar who has completed his formal training. These fellowships are typically postdoctoral, and most of them have been awarded to candidates outside the United States. Some 7,432 men and women from 98 countries (1,306 from the U. S.) have now held these fellowships for advanced study in 80 different countries. The fellowship program has been supplemented by scholarships and a variety of special study grants, including funds provided to other organizations for the development of promising talent. In addition, a high percentage of all grants made by the Foundation has included some training feature. The statistics of total effort take on their meaning only in relation to the individual mind.

The international community of science and scholarship has some interesting and instructive characteristics. Its ranks are open to all who wish to make a contribution of ideas; there are no admission committees. Its offerings are free to any who are able and willing to inquire. It bestows its accolades of respect largely on a basis of merit, for respect can be freely given or withheld. Precedence is not decided by procedures which can be commanded, influenced, or corrupted. Fraud and deceit are simply and effectively policed by the independent investigations of others. If authority overreaches and attempts to impose dogma upon fact, it is

rebuffed with contempt and sympathy flows to the victims of the clumsy effort. The community is linked by a strong network of communication through books, tens of thousands of scientific and learned journals, thousands of meetings, and a pervasive flow of travel and personal correspondence. If differences of language remain something of a barrier, much has been done to remove it; scientists and scholars of diverse origins and backgrounds quickly feel at home with each other.

Members of the community of science and scholarship necessarily think beyond national frontiers, and back across the sweep of man's experience. They know that nature does not give out her secrets with political discrimination. The brilliant innovator understands his debt to men of many countries and other centuries, and part of his satisfaction is in knowing that men unknown to him will build upon or supplant his work. Moderation and humility are in the environment, for the community's *raison d'être* is the discovery of truth and the exposure of error, including one's own. The assertion of personal or national interest is largely ineffective and ambition is subject to the disciplined discrimination with which the community bestows its respect.

Obviously, science and scholarship are matters of great concern to governments. A national society, acting through its political institutions, decides the extent to which its citizens may participate in and draw benefits from the general body of humane knowledge. The quality and breadth of the educational base, the generosity of support for research and higher learning, the encouragement to the intellectual professions, and the ease and freedom of exchange with other countries are subject to consciously determined policy and the allocation of resources. The extent to which new knowledge serves national well-being will vary with such factors as the availability of trained personnel, the mobilization of capital for new investment, and the readiness to adapt to new tech-

niques. What has been called "the revolution of expectations" in lesser developed countries is, in essence, a surging demand which can be served only by utilizing knowledge more effectively. At the heart of development, therefore, are education and research; these, in turn, call for fullest participation in the wider community of science and scholarship.

Knowledge is power, and power which can not escape the calculus of political rivalry. But a misunderstanding of the nature of knowledge can lead to unwise and self-defeating restrictions upon intellectual life. Transitory advantage to a particular nation may, indeed, result from new discoveries but scientists around the globe promptly occupy the new terrain. Dr. Warren Weaver asks, "Will we recognize that, in the realm of pure science, you cannot keep a secret—that all you can hope to do is to keep ahead?" Perhaps one might add: and keep ahead in relatively short spurts.

Basic knowledge about atomic energy was widely shared in an international community led by such men as Rutherford, Einstein, Bohr, Fermi, Joliot-Curie, Lawrence, and Oppenheimer. Underlying theory had been constructed and tested for decades prior to World War II. Perhaps the greatest "secret" about the bomb was given away by the explosion at Hiroshima—a public demonstration that this use of atomic energy was technically feasible. In their Agreed Declaration of November 15, 1945, the President of the United States and the Prime Ministers of the United Kingdom and Canada referred to atomic weapons "in the employment of which no single nation can have a monopoly." It was not the fear of espionage but an understanding of how men come to know about nature which prompted immediate demands for some effective form of international control of nuclear weapons to forestall the otherwise inevitable age of terror.

If basic knowledge eludes capture by power politics, intense rivalry occurs in putting such knowledge to use. Indus-

trial capacity, the allocation of resources, and emphases in education and training can be molded to the requirements of national policy with the help of fear, pride, determination, and willingness to sacrifice. The pace, complexity, and cost of this competition mounts and one of the costs is jangling nerves. Despite anxiety it does not follow that policy should aim to create monopolies of basic knowledge, for the attempt to do so would cripple rather than strengthen. Indeed, one may find a measure of safety in the world-wide sharing of basic knowledge for here monopoly, in whatever hands, could temporarily confer new orders of power and of the corruption which unrestrained power invites upon those who wield it.

Although this comment touches briefly upon vastly complex issues of national and international policy, two modest conclusions are hazarded. The first is that present tensions underscore the need to seek out and cherish those elements of modern life which bind men together across national and cultural frontiers. Of these, the great community of science and scholarship led the way. Here principle and practical advantage combine to claim encouragement, strong material support, and freedom from short-term political manipulation. Here men can draw inspiration and courage from what has gone before and join in aspiration for the future. Here, too, men can savor the experience of a common interest in which all might gain and none has to lose. It is a community to which many can contribute—private citizens, voluntary organizations, universities, governments, and international organizations. It is no small matter, for example, that the United States alone has been involved this past year with over 66,000 persons in educational exchange, that over 52,000 individuals from 145 countries and territories were studying or teaching in the United States, and over 14,000 Americans were at similar tasks in more than 50 countries abroad. The direct impact upon science and scholarship is

obvious; the indirect impact upon the quality and sanity of life is no less important.

Second, governments have demonstrated their ability to set political issues aside at selected points to cooperate effectively for the increased well-being of their peoples. Additional possibilities can be opened up with boldness and imagination and present effort can be improved and strengthened. If international politics has not yet found practicable means for settling disputes, there is much to be said for reducing the field of politics by steadily broadening the base of co-operation on the long-range humane interests of man.

## The Polish Science Program

For many years before World War II, beginning with the aftermath of World War I, The Rockefeller Foundation followed with interest and considerable financial support the work of Polish institutions and scholars. Between 1916 and 1919 modest sums were spent for emergency assistance to mitigate the devastating effects of the war on Poland and her people. Early in the 1920's the Foundation found opportunities to contribute constructively to public health, the medical and natural sciences, and the social sciences. The Ministry of Health of Poland was aided by both funds and personnel to initiate public health demonstrations, and to develop district health centers, public health nursing, and mental health services. Grants for buildings and equipment helped the State School of Nursing in Warsaw and the School of Public Health and Bedside Nursing of the University of Cracow. The largest amount of money to a single institution went to the State Institute and School of Hygiene in Warsaw, established and developed with the help of grants for building, equipment, teaching services, and course work. The Institute of Physics of the University of Warsaw,

enlarged with Polish government funds, was equipped largely through Foundation grants.

Foundation fellowship awards in the 1920's and 1930's enabled more than 200 Polish scholars to undertake advanced study and research in other countries. The majority of these scholars were appointed in the fields in which the Foundation was concentrating in Poland—public health, nursing, and the medical sciences. Many of these former Fellows are now contributing importantly to their fields in Poland through their responsibilities in schools, research institutes, and health units.

The outbreak of World War II interrupted the long collaboration with Poland which the Foundation had found both satisfying and fruitful. In the immediate postwar years, Foundation contacts were limited to a gift of books to ten leading libraries in Poland that had lost from 30 per cent to 100 per cent of their collections during the war.

An opportunity arose for the Foundation to resume its relations with Polish scientists early in 1957 when the Polish government invited Foundation representatives to visit their country. The group, led by Dr. Warren Weaver, Vice-President for the Natural and Medical Sciences, spent several weeks in February and March observing the work being done in Polish universities and institutes, meeting Polish scientists, and, with particular gratification, renewing acquaintance with former Rockefeller Foundation Fellows. Their visit, and subsequent discussions and correspondence with Polish government officials and scholars, led to grants in May, 1957, intended to help with a few of the most pressing problems in Polish science today. One grant of \$300,000 was for use in the purchase of scientific materials and supplies, books and journals, and minor items of equipment. A second of \$175,000 provided funds for fellowships to give younger Polish scientists opportunities to visit other countries for observation and study. Travel grants to enable mature, established

Polish scholars to meet their colleagues abroad and to familiarize themselves with research and its techniques in other countries were awarded with funds from the regular grant-in-aid budgets.

The Foundation's decision to concentrate its new grants for Poland on activities in medical education, public health, the biological and medical sciences, and agriculture was made with the knowledge that the Ford Foundation, also at the invitation of the Government of Poland, had initiated a program in the social sciences and humanities for Polish scholars and institutions.

Some 25 young men and women have been granted fellowships. Nineteen of these scholars have already begun their courses of study, the majority in the United States, but three in England, one in Scotland, and one in France. Chosen for their abilities, their capacity for original and independent work, and for their dedication to the service of science in their own countries, these new Polish Fellows will, it is hoped, find during their fellowship experience new insights into their disciplines, new skills and techniques, which will help them to contribute even more effectively to work in their fields in Poland.

Under the recently instituted and somewhat less formal scholarship program, four younger Polish scientists, all in the field of agriculture, received awards during 1957. Two of these scholars have already begun their studies in the United States, and a third is now working at the National Institute for Research in Dairying in England.

Grants in aid were awarded to 21 more mature Polish scientists during 1957. Through such grants, which provide for travel for two, three, or four months, they are being enabled to renew their acquaintance with their colleagues in other countries, and to observe the techniques, equipment, and discoveries developed in their fields of interest in the past ten years. Many of these scientists have already begun

their visits to a wide variety of institutions in Europe, in the United States, and Canada.

In a country twice ravaged by war in the space of fifty years, Polish scientists have made impressive efforts to maintain the continuity and the quality of advanced education and research. The obstacles they have had to overcome have been formidable: the loss of personnel—50 per cent of Poland's doctors, for example, did not survive World War II—and of the time their training represented; the destruction of essential equipment and library resources; the damage, often irreparable, to buildings and other facilities. A further handicap has been the difficulty to be overcome in replacing equipment and supplies not produced in Poland. The Foundation welcomed the opportunity given it to assist these Polish scientists by providing the dollar exchange needed for the purchase of minor but indispensable scientific tools for their work.

Under the general leadership of the Ministry of Higher Education, representatives of six Polish universities, medical academies, agricultural schools, and research institutes affiliated with the Polish Academy of Sciences and the Ministries of Health and Agriculture formed committees to determine the most urgent needs of their several institutions. In the lists eventually received in New York, 52 separate centers of education or research in 16 different cities or towns of Poland were represented. The lists covered a miscellaneous assortment of items—microscopes, microtomes, laboratory glassware, chemicals, books, scientific journals, and other small supplies. These are now being purchased in Europe and the United States and shipments to Poland have already begun. Separately the Foundation has sent, upon request, a complete set of the collected papers by its staff members to the State Institute of Hygiene in Warsaw.

With only limited resources to meet the many valuable and worth-while opportunities brought to its attention, the

Foundation does not expect to continue indefinitely its Polish Science Program on the 1957 scale. It is hoped, however, that the Foundation's collaboration with Polish science, resumed in 1957, can be continued in the years ahead and that Polish scientists will have an opportunity to play a significant role in the international community of science and scholarship.

## The "Marginal Utility" of Foundation Grants

The Trustees and officers of a foundation entrusted with relatively limited funds "to promote the well-being of mankind throughout the world" must give considerable attention to the strategic use and marginal utility of its grants and their relation to other and larger resources. The Foundation has, broadly speaking, shied away from assisting with routine running costs in order to be able to assist in undertakings of unusual significance. Reflecting upon the experience of the Foundation, Raymond B. Fosdick remarked, "The proper objective of a foundation, unless created for a particularized purpose, is to prime the pump, never to act as a permanent reservoir." It is relevant to note that more than two dozen universities in the United States alone have annual incomes which exceed that of The Rockefeller Foundation. "Building on strength," a minor, perhaps oversimplified, maxim of the Foundation, also reflects the concern for strategy. In essence, the Foundation has looked upon its grants as an addition to the best efforts which the recipient institution believes it can make with what it has or can get, for purposes which the recipient and the Foundation agree are of special urgency. This strategy of giving fails if its budgets are readjusted by the recipient to divert funds from the purpose for which a foundation grant is made. Conse-

quently, a grant often includes or assumes an agreement that existing support will be maintained or increased.

A simple illustration might be a grant of, say, \$50,000 a year over a period of years to a department of biochemistry in a university. The purpose of the grant would be to strengthen that department with resources beyond those which the university felt able to provide. Were the university, however, to withdraw \$50,000 each year of its normally budgeted funds for that department, or not permit that department to share in increased general funds, the department's ability to get on with its work would be unchanged by the Foundation's grant. In effect, the Foundation's money would be paying for the marginal expenditure of the university as a whole—not a compelling claim upon the limited funds of an endowed foundation.

Since the end of World War II, a special form of the same problem has arisen in connection with Foundation grants in countries which use a high degree of central planning. The Rockefeller Foundation holds no doctrinaire view about planning as such; it is active in countries with systems which range from a high degree of private enterprise to a rigorous planning of national resources. It has been successful in working out useful relations with all types.

Central planning is frequently found where there is a drastic shortage of foreign exchange, a shortage of capital for private and public investment, high priorities in achieving economic and social improvement as speedily as possible, and vast needs for which only slender resources are available. It is only natural that such countries might desire to include Foundation grants within the structure of their planning.

From the point of view of a foundation like The Rockefeller Foundation, however, there would be critical disadvantages were its grants to be absorbed into a national plan. A grant to a university or research institute would be of little avail were public funds in support of the same institution

simply diminished by the amount of the grant. Here again, the Foundation is much more likely to make a grant at points where extra effort is being made by those bearing local responsibility. Where national planning is involved, a reduction of support to an institution receiving a Foundation grant would mean, in effect, that Foundation funds were paying for the marginal expenditure of the national budget, or at least of its foreign exchange budget. Consequently, the Foundation has urged that its grants be looked upon as "windfall" additions to such support as can be mobilized locally. This view has been readily accepted because windfalls can make a useful and important contribution beyond planned effort.

There is an additional reason why a problem which is difficult in theory is usually resolved easily in practice through mutual understanding. The Foundation does not make allocations on a national basis but, typically, makes its grants to universities, research institutes, and other scientific and educational institutions. It has little experience in assessing or comparing one nation's claim against another's. It has had a great deal of experience in identifying promising scientific and scholarly opportunities where outside support could significantly increase a contribution both to the nation and to the larger society of man. This is a more appropriate role for an independent nonpolitical foundation than would be the making of highly political judgments as to the relative claims of nation states.

A somewhat similar question arises in the award of Rockefeller Foundation Fellowships. The Fellowship Program is an international program; candidates from one country, in effect, compete with candidates from all others. Fellowship vacancies are not assigned nationally but are flexibly available on a world-wide basis to support promising candidates in the fields in which the Foundation is active. For this reason, the Foundation reserves the right to name those who hold Foundation Fellowships. It is glad to receive nomi-

nations from a variety of sources, including official sources. It understands, of course, that an institution or a government may be unwilling to release an individual in order that he might accept a proffered Fellowship, but this question is usually clarified before an award is made. The Foundation does not delegate responsibility for making the final awards. The foregoing applies only to Foundation Fellowships. In a few special instances limited funds have been available to institutions or government agencies for awards to candidates of their own selection. Where such funds are provided, the naming of the fellows would be the responsibility of the institution or agency making the awards; the fellows would not then be designated as Rockefeller Foundation Fellows.

## Public Health Aspects of Nuclear Energy

In its Annual Report for 1956 The Rockefeller Foundation announced that an "important area of Foundation concern with the nuclear age might be called the public health of nuclear energy, broadly conceived." "Man is now capable," the Report continued, "of adding significantly and dangerously by his own actions to the inescapable natural radiation already present in his environment. He can do this by nuclear war, by a sustained and large-scale testing of nuclear weapons, by the pollution of food, air, and water through inadequate disposal of wastes. Increasing numbers of individuals can be subjected to additional hazards by radioactive therapy, by industrial accidents, or by the handling of the increasing quantities of radioactive materials without proper protection."

### THE SOURCE OF THE PROBLEM

Following the demonstration in 1939 of the fissioning of uranium 235 under bombardment of neutrons, the mili-

tary applications of this phenomenon overshadowed every other aspect for the next decade. However, those deeply engaged in the study of this newly available form of energy clearly recognized that the explosive release of energy could be slowed down and controlled. This slow and controlled release of energy as heat could replace the conventional combustion unit or boiler in the usual power system so that practical electrical power could be produced from materials widely available in the earth's crust.

Not only could the natural uranium 235 be separated and used for power production, but by transformation in a reactor system of the far more abundant uranium 238 to plutonium or the similar transformation of ordinary thorium to uranium 233, it would be possible greatly to extend the available sources of nuclear energy. These fissionable elements which have been so prominent in the development of the military uses are equally fundamental in the taming of the power of the atom for peacetime purposes.

Plutonium is produced in quantity in every reactor where natural or enriched uranium is employed. This by-product, plutonium, is itself a nuclear fuel, and the value to be placed on the plutonium content of exhausted reactor fuel elements is an important determinant in the economics of power reactor design and operation. In one family of reactors it is possible to produce more plutonium from the U<sup>238</sup> than is consumed in the fission process. This is the breeder reactor in which, although power is being obtained, new fuel is formed faster than it is burned and the reactor finishes its run with more plutonium than at the beginning.

Related to this is the utilization of thorium. No known isotope of thorium is fissionable but when ordinary thorium is exposed to neutrons, the thorium 232 becomes converted into uranium 233, fissionable in the same manner as uranium 235 or plutonium 239. The economics of the thorium system are such as to make it of little attraction in the United States,

but it is of outstanding importance to those countries possessing large thorium resources rather than uranium, as is the case with India.

The great importance of these breeding possibilities is that all of the uranium and thorium available can be converted to energy, and not just a very small fraction of natural uranium that is U<sup>235</sup>. Furthermore, as industrial technology has improved, lower uranium content in minerals has been economically acceptable so that it may be said that no country in the world lacks the raw material of nuclear power, and many of those with especially rich deposits of uranium or thorium are among those industrially handicapped at present by the lack of fossil fuels.

Power demands have been increasing exponentially for many years. Extrapolation of the curve of power requirement in the United States indicates the possibility of an eight-fold increase by the end of this century, when the population might well have doubled. Estimates of the usable reserves of fossil fuels may differ, but by the year 2000 it seems highly probable that most of the electrical power of many countries will be obtained from atomic energy.

Looming indefinitely in the future are the prospects of the controlled release of energy by fusion of light nuclei instead of the fission of certain heavy elements. In a system employing a controlled fusion reaction with deuterium, the heavy isotope of hydrogen, the primary material is, for practical purposes, inexhaustible, and is already so cheap that the fuel cost could be considered negligible among the other costs of producing power from this source. That some way will be found to utilize this source of energy is generally assumed, but at the present time this is a belief and an act of faith rather than a demonstrated fact. The great energy development during this and the next generation seems likely to be by the fission route.

As yet it is not fully appreciated that the massive use of

atomic energy will bring in its train a large number of complicated and difficult problems from which there is no escape and for which reasonably satisfactory solutions must be obtained. Similar situations arise from the use of radioactive materials in industry, agriculture, and medicine. The use of nuclear reactors as radiation sources presents the same technical problems and health hazards as the atomic power plant, although usually on a much smaller scale.

A further engineering feature of the atomic age is the introduction of toxic materials for which there has been no previous experience. Elements previously known only in minute amounts are being produced and utilized in ton quantities. Synthetic compounds of radically new character are being introduced as new materials in reactor design. As a result, an unknown number of chemical hazards will be added to those of radioactive nature.

A further characteristic of the hazards of the nuclear era, in contrast to our prior industrial experience, is the capability for their extension to large sections of the population. Chemical constitution no longer forms the only basis of toxicity. We deal with a large number of substances which can enter biological processes as do ordinary elements, but carry with them the possibility of injury to living organisms through their nuclear radiation.

#### A TASK FOR THE UNIVERSITY

It is against this background of present and future development that universities and especially their schools of medicine and public health are reviewing their responsibilities. The maintenance of the public health and safety requires that knowledge of the hazards and their control must precede any appreciable development of a large section of the atomic industry. A new kind of health expert is required, one whose training encompasses a far broader scientific area than heretofore, and who has an adequate under-

standing of the very important social, economic, and legal factors that enter into his problem.

There is far more involved here than the practical training which can be acquired in industry itself. The latter is necessary for the training of operating personnel once a particular system has been brought into existence. It cannot produce the type of highly qualified expert who can bridge the gap between the conventional public health area and that of the engineers, physicists, and chemists, and can assist in charting, in their earliest phases, the directions which nuclear development must take.

This broad function clearly lies with the universities and especially with those having an established interest in approaching such problems on a broad base. New departments have not seemed to be required or advisable. Rather, the trend is toward a functional relationship in which the teaching and research resources of many departments and schools can be brought to bear upon the task. Because of the nature of the training it has seemed to those making the first moves that the program should be based primarily in the school of public health, where such exists, or in the medical school, but with the clear recognition that the requirements go beyond the capacities of any single school as presently constituted, and must extend to the other faculties.

With these first steps in mind, the Foundation is supporting broad programs of special advanced training in several universities. No two of these are identical. In each instance the institution is undertaking to develop a university-wide curriculum starting from its own base of prior experience. While the objectives are similar, the programs differ in emphasis as a reflection of the special resources and opportunities which may be enjoyed by the respective institutions.

The New York University Institute of Industrial Medicine<sup>1</sup> is emphasizing chemical and radiological toxicologic

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<sup>1</sup> A grant to this institution was authorized in 1957 but not appropriated until 1958.

problems that are encountered in many phases of the atomic energy industry. Quantitative aspects of environmental contamination are a special consideration as a result of the University's close association with health and safety problems encountered by the Atomic Energy Commission.

The School of Public Health of Harvard University lays special emphasis on the problems associated with airborne chemical and radiologic contamination. This leads to substantial emphasis on the radiobiological problems encountered by large populations where appreciable amounts of radioactive material may be transported by air movement.

On generally similar but somewhat divergent lines is the development of a program at the Graduate School of Public Health of the University of Pittsburgh. Here the proximity to major activities in the production of nuclear power gives unusual opportunity for both theoretical and practical training in matters connected with reactor design and operation. The curriculum not only extends widely through the departments of the Graduate School of Public Health, but also enjoys a far-reaching participation by other schools of the University, notably the Engineering School and the School of Law.

Johns Hopkins University has chosen to place its primary emphasis in the expanded Department of Biophysics. This department has three divisions: one on the Homewood campus, the other two in the School of Medicine and the School of Hygiene and Public Health respectively. The general orientation plan extends far beyond the ordinary boundaries of biophysics to include concerns in the School of Hygiene and Public Health especially.

To each of these institutions The Rockefeller Foundation has made \$500,000 available to add flexibility to the program and to assist in the more effective use of much greater resources from public and other funds. The Foundation's funds also permit the stabilization of faculty and a

longer range planning of program than would otherwise be feasible. In supporting these somewhat divergent approaches to a complicated set of problems, the Foundation has recognized that as a practical matter the ultimate program will be the result of normal growth within the institution and that the most effective way to encourage it is to build upon a university's existing experience and competence.

## A National and International Center for the Performing Arts

The Lincoln Center for the Performing Arts is a bold and imaginative concept toward the realization of which The Rockefeller Foundation has contributed a total of \$10,050,-000. The general outline of the plan and the allocation of the Foundation's grant among the various components which together constitute the Center are described in the Annual Report, but certain aspects of the venture deserve emphasis here.

New York's traditional position as the national capital of the performing arts in the United States is of long duration and derives from substantial considerations. Perhaps foremost among these is the size of the metropolitan New York audience for theatre, opera, music, ballet, and their kindred arts. Composed both of permanent residents and transients, this audience supports more and more varied productions than can be seen in any other city of the United States.

Linked closely to its national leadership is the city's increasing stature in the international artistic scene. New Yorkers and Americans in general now compare their own efforts with the best of those of other countries, an experience which is both humbling and encouraging. International

exchange in the arts is a two-way flow. To strengthen and increase the opportunities for the performing arts in New York is indirectly to aid them internationally.

New York has long been in need of modern facilities for housing its major performing organizations—the Metropolitan Opera and the Philharmonic Orchestra—and of suitable houses for ballet and a repertory theatre. This need the Center will go far toward supplying. The Center will in addition have two smaller houses for the proper presentation of innovative and experimental productions, and all the houses will be available for visiting organizations, both national and international, during much of the year-round season. But the importance of the Center far transcends the provision of physical facilities. The concept includes also great emphasis on education, through the location on the twelve-acre site of the Juilliard School of Music and of a library-museum. One-quarter of the Foundation's grant is earmarked for the fund which will support scholarships and artistic development in music, the dance, and drama.

The Foundation's activity in the humanities, as in its other fields of interest, has never centered on buildings. Brick and mortar are necessary ingredients in the establishment of strong institutions in whatever field, but the dynamic functioning of the institution is the important thing which the Foundation seeks to support. In the arts the Foundation's aim is to encourage the flow of creativity which alone can bring innovation and change on the one hand and the perfection and strengthening of vital traditions on the other. The Lincoln Center project does not solve all the problems of encouraging creativity in the performing arts. But the interplay of related arts at the Center and the associated educational work may well offer a unique stimulus to creative development.

## Universities and the Well-Being of Mankind

Universities have always held a central position in the program of The Rockefeller Foundation. Corporate members of the community of science and scholarship, the universities have served as trustees of man's intellectual inheritance and a prime source of its progressive enrichment. A Foundation directed by its charter "to promote the well-being of mankind throughout the world" must give thought to pressing practical problems, yet a large proportion of its funds has gone to universities. The reasons are many. The notion of well-being is not confined to material needs. It is in the nature of man that he attempt to understand his experience. He has a curiosity demanding satisfaction, a regard for intellectual order moving him toward philosophy, and a yearning for beauty. The pursuit of knowledge, truth, and beauty for their own sakes enhances life and lifts the concept of well-being beyond physical satisfaction and security.

But even in its efforts to contribute to what are commonly thought of as "practical" needs, the Foundation has found itself in partnership with universities in all parts of the world. The solution of practical problems must frequently await more knowledge, and the extension of knowledge is a central task of the university. Action to deal with practical problems requires trained leadership, and the university is the most important training ground for exceptional talent. These are among the thoughts which led The Rockefeller Foundation and its companion Rockefeller endowed philanthropy, the General Education Board, to invest approximately a quarter of a billion dollars in those leading American institutions now members of the Association of American Universities.

When the Trustees of The Rockefeller Foundation decided in 1956 to increase substantially their grants in

Latin America, Asia, the Middle East, and Africa, it was expected that universities and other institutions of higher learning would occupy an important place in the expanded program. By calling upon its capital fund as well as its income the Foundation's grants during 1957 to universities in these areas reached a total of \$8,572,711, the largest being one of \$5,000,000 to the American University of Beirut.

It is deeply encouraging to note that governments which are sorely pressed by their peoples for immediate economic and social improvements are recognizing that science and scholarship at the university level are indispensable to national development. Education, including higher education, figures prominently in national planning. Further, the front rank of world universities needs additional members from Latin America, Asia, the Middle East, and Africa. There are understandable reasons why these areas have not seen the rise of a larger number of great international centers of learning. But the hope must be, from the point of view of the international community of science and scholarship, that the coming decades will show a marked change.

The accompanying map shows the location of universities receiving Foundation grants during 1957. Other maps could show similar interests by other foundations, by governments, and by international organizations. The ICA contracts which bring American universities into direct co-operation with universities abroad are an impressive addition to the growing number of mutually beneficial relationships.

## The Foundation's Operating Programs

The Rockefeller Foundation typically acts through grants to other institutions of an educational or scientific

nature. For many years, however, it has elected to carry out certain tasks through its own professional staff. In earlier research and demonstration campaigns against yellow fever, malaria, and hookworm, the medical staff of the Foundation worked cooperatively with governments and medical colleagues abroad to train personnel and develop techniques for controlling or eradicating these important health hazards. This particular function has now been taken over almost entirely by governments and international organizations.

At present, Foundation staff are engaged in two operating programs, a world-wide study of insect-borne viruses and a broad program of research and demonstration affecting basic food crops. Both activities are international in that national segments are linked by a lively exchange of information, material, and personnel. Both place emphasis upon training and include strong support through fellowships, scholarships, and travel grants. Both bring the Foundation staff into day-to-day collaboration with scientific colleagues abroad, frequently in jointly administered or cooperative laboratories and experiment stations. And both are reinforced by grants to universities in support of the basic research on which progress must rest.

Dr. Robert S. Morison, Director for Biological and Medical Research, and Dr. Max Theiler, Director of the Foundation's New York Laboratories, are in charge of the virus program. Dr. J. George Harrar is Director for Agriculture. Their descriptions of the two programs follow.

#### ARTHROPOD-BORNE VIRUSES

The virus research program of The Rockefeller Foundation is concerned with world-wide study of the virus infections transmitted to man and domestic animals by the bite of arthropods. The program has been planned to include comprehensive study of the number and nature of the



Universities of the world which received Rockefeller Foundation grants during 1957.

viruses, as well as of their clinical manifestations, epidemiology, and geographic distribution.

The work of The Rockefeller Foundation Virus Laboratories in New York is coordinated with that of field stations in South America, Africa, and India. Two units are located in South America: one at Port-of-Spain, Trinidad, is maintained in collaboration with the Health Department of the Government of Trinidad and Tobago and the Colonial Research and Development Scheme; the other at Belém, Brazil, is operated in conjunction with the Special Service of Public Health of the Ministry of Health with professional and technical staff contributed by the Institute of Medical Microbiology of the University of Brazil.

In the Union of South Africa, at Johannesburg, a unit is maintained in cooperation with the South African Institute for Medical Research, the Council for Scientific and Industrial Research, and the Poliomyelitis Research Foundation of South Africa which provides laboratory space, services, and maintenance. In India a station at Poona is operated jointly with the Indian Medical Research Council. In Berkeley, California, a unit is working in cooperation with the State Department of Health. For the support of the virus research program, the Foundation appropriated \$1,197,060 during 1957.

Knowledge of the number of different agents is of cardinal importance in the study of arthropod-borne animal viruses. Although morphology is of great value in distinguishing different species in the animal and plant kingdoms, it is of very limited value in the study of viruses. The system of classification adopted depends entirely on immunological principles. It has been found that when an animal is infected with one agent, it produces antibodies not only to this infecting agent but also, to a greater or lesser extent, to allied viruses. A knowledge of these immunological over-

laps is of great importance not only for classification of the viruses but also for interpretation of serological findings.

Three methods are available for the demonstration of antibodies. The first is the hemagglutination-inhibition (HI) test which depends upon the ability of many of the arthropod-borne (arbor) viruses to produce a clumping or agglutination of the red blood cells of certain birds. An immune serum prepared to the virus used in the test has the ability to prevent or to inhibit this hemagglutinating effect. Hemagglutination inhibition will also occur, though usually to a lesser extent, with immune serums prepared to any allied virus.

The second method, known as the complement-fixation (CF) test, is very complex but, like the HI test, is performed in test tubes and shows a great deal of immunological overlap between allied viruses. While, to date, hemagglutinating antigens have been prepared from only 40 distinct viruses, complement-fixing antigens have been prepared from all. The third, and often the most specific test, is the neutralization test. In this test the power of an immune serum to protect an animal by neutralizing the virus is determined.

The complexity and extent of The Rockefeller Foundation virus program are shown by the fact that up to the present time more than 70 distinct viruses have been discovered. Many of these belong to three immunologically related families which have been called groups A, B, and C. To group A belong such important agents as the viruses causing eastern, western, and Venezuelan equine encephalomyelitis of the Americas. During the course of the year three new agents belonging to this group were discovered. One, the Middelburg virus, was isolated from mosquitoes in South Africa, and two were isolated, also from mosquitoes, in Malaya. The latter were obtained through the courtesy of Major E. L. Buescher of the Walter Reed

Army Institute of Research in Washington. The importance of the three new agents as causes of human infection is not known at present.

Group B is the largest and most important of the groups. To it belong such agents of human disease as yellow fever, dengue, and St. Louis, Japanese B, Murray Valley, and Russian spring-summer encephalitis viruses. Within the group several subgroups of closely allied agents can be clearly distinguished. One consists of yellow fever, Uganda S, and H 336 viruses. The last, at present unnamed, was isolated in South Africa from the blood of a child suffering from fever. The two types of virus producing dengue fever in man are very closely related and form a distinct subgroup. To another subgroup belong St. Louis, Japanese B, and Murray Valley encephalitis viruses, and West Nile and Ilhéus viruses. It is possible that the Bussuquara virus, recently isolated from a sentinel monkey in the Amazon Valley, belongs to this group. Nothing is known concerning this agent's possible importance as a cause of human infection.

Another clearly defined subgroup has been named the Russian tick-borne complex. The members of this subgroup, as the name indicates, are all transmitted by the bite of a tick. The history of their discovery is of considerable interest.

The first member, louping ill virus, was discovered in 1930 in Scotland and is the cause of a severe disease of sheep. In 1937 a virus was isolated in Siberia from cases of human encephalitis which has been called Russian spring-summer or Russian tick-borne encephalitis. Both of these agents have been shown to be transmitted by the bite of ticks belonging to the genus *Ixodes* and to be immunologically almost identical.

Two other agents, the viruses causing Omsk hemorrhagic fever and biundulant fever, have been isolated by workers in the Soviet Union. These have been shown to be

immunologically very close to, if not identical with, Russian spring-summer encephalitis. In recent years a great deal of evidence has been obtained that infections with viruses closely related to RSSE are very prevalent in Eastern Europe and are found from Sweden and Finland in the north to Yugoslavia in the Balkan Peninsula in the south. It will be apparent that all the agents belonging to this subgroup mentioned so far were discovered on the Eurasian continent. The major portion of this continent forms a single unit both geographically and biologically, and has been named the Palearctic zoogeographical area.

The first indication that infection with the Russian tick-borne virus complex occurs outside the Palearctic region was obtained in India during the preliminary immunity survey for antibodies in human sera made at the time of the establishment of the virus research unit in Poona. Of a total of 588 sera obtained from young adult males, eight were found to have antibodies capable of protecting mice against the virus of Russian spring-summer encephalitis. Six of these sera were obtained from individuals living in Kutiyana in Saurashtra province. The other two were obtained from residents of Kingaon and Tiruvellore, in Bombay and Madras provinces, respectively. These findings were considered at the time to suggest strongly, but not conclusively, that infection with RSSE occurs in India.

The first incontrovertible evidence that a virus belonging to the Russian tick-borne complex is present in the Oriental zoogeographical region was obtained in Malaya by Dr. C. E. Gordon Smith who, in 1956, isolated a virus from Ixodid ticks which was immunologically indistinguishable from RSSE.

The circumstances leading to the discovery in India of an agent belonging to the Russian tick-borne complex of viruses are of unusual interest. On March 23, 1957, the Virus Research Centre in Poona was informed by Dr. T.

Ramachandra Rao that monkeys had been observed to be dying in forest areas of Shimoga District in Mysore State. A field expedition, organized immediately to investigate, found that not only were monkeys dying in large numbers in the area, but cases of a febrile illness were occurring among human beings, sometimes with a fatal outcome. The association of a fatal epizootic in monkeys with severe infections in humans is highly reminiscent of sylvan yellow fever.

Strains of virus were readily isolated from both dead monkeys and cases of human illness. It was soon established that the cause of the disease in monkeys and man was identical, and that the causative agent was very closely related to, but not identical with, the virus of Russian spring-summer encephalitis. Investigation further revealed that the disease was limited to a relatively small area in the Kyasanur Forest and that a similar epidemic had occurred during the previous year. Inhabitants of the region were convinced that the disease was new to the region. The high mortality in the monkey population had been observed for only two years. The inhabitants had come to the conclusion that the human disease was caused by the smell of decaying monkeys.

Further investigation indicated that man acquired the infection in the forest. The marked seasonal incidence of the disease in man was clearly associated with the work habits of the population. During the monsoon season, when the inhabitants did not enter the forest, no cases of human infection occurred.

Entomological investigations to determine, if possible, what type of blood-sucking arthropod was responsible for the spread of infection indicated that mosquitoes probably played no part in the virus cycle. Mosquitoes were, indeed, remarkably scarce in the region. When, early in the investigations, it was found that the Kyasanur Forest disease virus

belonged to the Russian tick-borne group of agents, the possible role of ticks was investigated. Agents identical to KFD virus were readily isolated from ticks of the genus *Haemaphysalis* caught in the region where the disease occurred. The rapidity of the elucidation of the etiology of the disease and of its major epidemiological features is an example of the utility of The Rockefeller Foundation virus program.

These important findings immediately suggested logical control methods. As the tick had been shown to be the vector of the disease, tick control or eradication methods were considered by the Indian government. The immunologically close relationship of KFD virus to RSSE virus suggested the use of a vaccine to protect the local exposed population. Scientists in the Soviet Union had developed a vaccine for the prophylactic inoculation of individuals in regions where RSSE occurs. The Russian vaccine is a killed vaccine, inactivation of the virus being produced by the action of formaldehyde. The available evidence in the literature indicated that this vaccine was both safe and efficient as an immunizing agent.

The apparent spread of the disease in the Shimoga District, and the considerable mortality in man, posed a very serious public health problem for the Indian government. It was therefore decided to immunize the population at risk, but no laboratories were available in India for the large-scale manufacture of vaccine. However, the Walter Reed Army Institute of Research in Washington very generously offered to manufacture 50,000 doses of vaccine. This institute has had a great deal of experience in the manufacture of vaccines and has, since the initiation of The Rockefeller Foundation virus program, supplied a variety of formalin-inactivated vaccines, including one for RSSE, for the immunization of the Foundation's staff.

It was first decided to prepare the vaccine with strains

of virus isolated in India. Preliminary studies indicated, however, that a vaccine prepared with KFD virus was of very poor immunizing quality. In view of the emergency, it was then decided to prepare the vaccine with a strain of Russian spring-summer encephalitis virus. The production of this vaccine is now under way, and the first lots have been sent to India. A special Rockefeller Foundation appropriation of \$100,000 will aid the vaccination campaign, pay for 50,000 units of vaccine, and enable Indian scientists to study vaccine production techniques in the United States.

It is generally accepted that killed virus vaccines are not as efficient immunizing agents as living attenuated vaccines. In the arbor virus field, however, killed vaccines have been used for a variety of agents, and are available in the United States for the prophylactic inoculation of horses against eastern and western equine encephalitis. The results with both of these appear to be satisfactory. A similar type of vaccine prepared with Japanese B encephalitis virus has been tested experimentally in a large number of individuals, but the results have not been very encouraging.

As mentioned previously, the available evidence indicates that an inactivated RSSE vaccine has proved to be quite efficient. However, the immunization with this vaccine has the very serious disadvantage that three inoculations are necessary. Moreover, the immunity produced appears to be of short duration and to require a yearly "booster" inoculation. A living attenuated vaccine, the 17 D for yellow fever, however, produces an immunity of many years' duration with a single inoculation. It is apparent, therefore, that the development of an attenuated strain of the Kyasanur Forest disease virus is the logical solution to the Indian problem. Experiments are now in progress, at the Poona as well as the New York laboratories, in an attempt to develop such an attenuated strain.

In its clinical manifestations Kyasanur Forest disease

closely resembles Omsk hemorrhagic fever; the Indian disease, however, appears to be more severe in that it causes considerable mortality while the Russian disease is rarely fatal. It is significant that in both no signs of involvement of the central nervous system have been reported. These observations emphasize the fact that clinical manifestations are of very little value in the classification of causative agents among the arbor viruses. In the Russian tick-borne complex of viruses, agents which are very closely related immunologically, individual members produce a great diversity of symptoms. RSSE is often characterized by severe central nervous system involvement. Louping ill produces encephalitis in sheep. Omsk hemorrhagic fever is a nonfatal infection with no signs or symptoms of involvement of the central nervous system but with marked hemorrhagic tendencies. The clinical picture of Kyasanur Forest fever resembles that of Omsk hemorrhagic fever but with a higher mortality. A fifth member of this complex, the virus of biundulant fever, causes, as a rule, a nonfatal infection characterized by two paroxysms of fever often separated by an afebrile interval of several days. Deaths following infections with louping ill or RSSE viruses are obviously caused by infection of the central nervous system. The cause of death in KFD is not known, but limited pathological investigations of fatal infections of man and monkeys indicate that the liver is involved. In this respect KFD more closely resembles yellow fever than Russian spring-summer encephalitis.

Group C, the third group of immunologically related agents that has been established, has so far been isolated only near Belém in South America. Furthermore, more members of group C than of the other groups have been isolated in that region. Intensive studies have indicated that at least five clearly distinguishable viruses, which have been named Apeu, Caraparu, Marituba, Murutucu, and Oriboca,

are present. All have been isolated from sentinel animals, and three, Caraparu, Marituba, and Oriboca, from humans and mosquitoes as well. Limited surveys for antibodies in the sera of residents indicate that infections with group C agents are very prevalent indeed. Very little is known concerning the clinical manifestations in man. Although no viruses belonging to this group have, to date, been isolated in Africa, surveys with sera indicate that infections of man with members of the group are fairly prevalent.

Of all the arthropod-borne viruses studied to date, 37 have been shown to be members of one or another of the three groups. Approximately 38 remain that appear to be distinct identities and to have no relationship to any of the three immunological groups. These viruses form a very heterogeneous collection. Very little is known about many of them, and it is possible that some are of no importance in the production of infection in man and his domestic animals. However others, of which a few will be mentioned, are of definite public health interest.

Rift Valley fever, at present known only in Africa, is the cause of extensive epidemics in sheep and produces abortion in pregnant ewes and high mortality in lambs. Blue tongue, also a disease of sheep, is of considerable economic importance. It was thought, at first, that blue tongue was confined to the Ethiopian region, defined as Africa south of the Sahara, but it has in recent years been reported from Egypt, Israel, the island of Cyprus, and the western United States. One of the first animal diseases shown to be caused by a virus is African horse-sickness. Until a vaccine was developed, this disease was a very important cause of mortality in horses in Africa, the only region where the virus has been found. Both blue tongue and horse-sickness are transmitted by small biting flies belonging to the genus *Culicoides*. In the Mediterranean, two distinct viruses produce infection in man, at times in epi-

demic form. The disease in man is generally known as sand-fly or phlebotomus fever. In parts of the western United States Colorado tick fever, a disease transmitted by ticks, is prevalent.

The continual discovery of new arthropod-borne viruses is good evidence of the great variety of these agents in nature and of the fact that it is not yet possible to state categorically how many distinct viruses there are in the various parts of the world. An analysis of the distribution and prevalence of the different arbor viruses in various zoogeographical regions is very illuminating. The most striking finding is that the tropical regions have supplied by far the greatest number. Of these, South America leads with 27 distinct viruses. The Ethiopian region is a close second with 24. In the third great tropical area, the Oriental region in which belong India, Malaya, the Indonesian Archipelago, Indo-China, and the southern portion of China, 15 distinct arbor viruses have been isolated to date. It is possible that many more will be found since investigations in this region are all of recent date; in both Africa and South America extensive studies have been going on over a much longer period of time. In North America to date, nine distinct arthropod-borne viruses have been described. The difference in the number of agents found in South and North America is striking and undoubtedly significant. In the vast Palearctic region, an area which includes the whole Eurasian continent with the exception of those areas which belong to the Oriental region, as well as that part of Africa north of the Sahara desert, 12 distinct arbor viruses have been identified. In the Australasian region only three viruses are known to occur. This paucity may be due in part to the fact that very little investigation has taken place there.

Tropical regions are distinguished from the more temperate zones by the abundance and variety of animal

life. It is probable that all the arbor viruses are maintained in nature by cycles involving vertebrates as well as arthropods. Furthermore, in the tropics the marked seasonal changes characteristic of regions distant from the equator are absent. As a consequence, conditions are often favorable for the year-round breeding of both vertebrates and arthropods and thus for the year-round maintenance of the virus cycles. It is not surprising, therefore, that it is in the tropical regions that the greatest variety of arbor viruses is found.

It is a reasonable assumption that all agents belonging to any one of the three well-defined immunological groups have evolved through the ages from a common ancestral type. An analysis of the distribution of group B viruses is particularly instructive as an indication of possible lines of evolution.

In the Ethiopian region ten distinct group B viruses are found, as well as representatives of all the major immunological subgroups, with the one exception of the Russian tick-borne complex. In no other zoogeographical region have so many and such a diversity of group B agents been discovered. Only in Africa do viruses closely related to yellow fever occur. Allusion has been made previously to this subgroup, which contains, in addition to yellow fever, Uganda S and the recently discovered H 336. Although yellow fever is known to be present in tropical America, no closely related viruses have been found in the Americas. This is a good argument for the theory that the original home of yellow fever was Africa, and that it was introduced into the Americas, probably in historical times.

The two closely related dengue strains are other agents which, in all probability, were transported in recent times through the tropical regions of the world. There is good evidence that dengue first appeared in the Caribbean during historical times. On its first introduction, toward the

end of the eighteenth century, epidemics of dengue were widespread in the Caribbean and the United States. Physicians at that time were all convinced that they were observing a new disease entity. Dengue and yellow fever are the only group B agents which, to date, have been shown to be able to maintain themselves in a cycle involving only man and the mosquito. These are, consequently, the two viruses most likely to have been transported during the era of sailing ships. The dengue viruses have the widest geographical distribution of all the group B agents. Strains of type 2 dengue virus have been isolated in Africa, the Oriental region, South America, and in New Guinea in the Australasian region.

If yellow fever and the dengues are excluded, analysis of the other group B agents isolated in the various zoogeographical regions indicates that they are, as a rule, closely related immunologically. In South America, the three viruses, Ilhéus, St. Louis, and the recently discovered Bussuquara, are all closely related. The distribution of St. Louis encephalitis virus extends into North America. The only other group B virus in North America is an agent isolated on several occasions in Texas and California from the salivary glands of insectivorous bats. Its closest relative, from an immunological point of view, is the St. Louis encephalitis virus.

One of the major subgroups contains the West Nile and Japanese B and Murray Valley encephalitis viruses. The agent of West Nile fever was originally discovered in Uganda in Central Africa. Subsequent investigations showed that infections with this virus were very prevalent in Egypt and the cause of a febrile disease in Israel. This virus has also been isolated in India where, in addition, the closely related Japanese B encephalitis virus is found. Farther east in the Oriental region only Japanese B is found. This virus has a very wide distribution, occurring

in Malaya, China, Japan, and the Maritime Provinces of the Soviet Union. In the Australasian region, Murray Valley encephalitis virus, an agent very closely related to Japanese B, is found.

The group B agents that are prevalent over the major portion of the Palearctic region belong to the Russian tick-borne complex of viruses. On the fringes of this large zoogeographical area other group B agents occur. As indicated above, the West Nile virus is present in Egypt and Israel and the Japanese B encephalitis virus in Japan, Northern China, and the Maritime Provinces of the Soviet Union.

With one possible exception, all the tick-borne viruses in group B are members of the Russian tick-borne complex. The possible exception is the agent of Nairobi sheep disease which has been known for many years as a severe tick-borne viral infection of sheep in East Africa. Recent studies with immune sera obtained from the East African Virus Research Institute in Entebbe indicate that, in all probability, this agent is a member of group B. The serological studies to date do not indicate that Nairobi sheep disease is closely related to RSSE.

Three serological techniques are available for the identification of newly isolated viruses. Because they are biological reactions, these tests are subject to a great deal of variation, particularly the neutralization test. It is consequently often impossible to decide if a newly isolated agent is identical with or only closely related to one of the reference viruses. This problem has arisen chiefly in the large group B where immunological overlaps are often very marked. The development of antibody adsorption techniques has provided a very valuable method for determining more clearly the antigenic relationship between the various members of the group. The principle of this technique is basically very simple. If, to an immune serum

an excess of the homologous virus is added, and, after incubation, the mixture is submitted to high-speed centrifugation, the virus particles with the adsorbed antibodies are sedimented. In this way all the antibodies are removed. Adsorption with an excess of a closely related virus removes all cross-reacting antibodies, but does not remove the specific homologous antibody. By the use of this technique it can be readily determined if the agents are identical. This method has therefore come into use for the identification of newly isolated group B viruses. Of equal importance is the fact that this method makes possible determination of the degree of immunological overlap between two agents.

The Russian tick-borne complex of viruses is now being intensively studied by these adsorption techniques. Of particular interest, because of its practical importance, is the exact relationship of the Kyasanur Forest disease virus to that of Russian spring-summer encephalitis. This study should give the information needed for a reasonable prediction of the possible efficacy of an RSSE vaccine in protecting man against Kyasanur Forest disease.

Of fundamental importance are the results of antibody adsorption studies with various strains of yellow fever. It had been assumed that all strains of yellow fever are immunologically identical, inasmuch as extensive studies in the past with the techniques then available had not demonstrated any immunological differences. However, the more refined techniques of antibody adsorption have clearly established that this is not so. The JSS strain of yellow fever, originally isolated in South America, has been shown to differ from the two attenuated African strains, known as the 17 D and the French neurotropic, now used for the vaccination of man. The 17 D was obtained by the prolonged maintenance in tissue culture of the Asibi strain of yellow fever, whereas the French neurotropic strain was developed by the passage of the French strain in mice.

The results of antibody adsorption experiments indicate that the JSS strain is antigenically defective when compared to the two other yellow fever strains. The experiments also indicate that the 17 D strain apparently possesses an antigen not present in either the JSS or the French neurotropic strain. Good evidence has also been obtained that the French neurotropic strain is immunologically identical with the French viscerotropic strain from which it was derived. These results are reassuring in demonstrating that prolonged passage in the mouse brain does not necessarily lead to any antigenic modification. This finding is of cardinal importance in the development of attenuated strains to be used for human immunization.

The neurotropic and viscerotropic strains of yellow fever exemplify the fact that two completely different clinical pictures can be produced by infection with immunologically identical agents. The French viscerotropic strain produces in the rhesus monkey a severe disease leading to death caused by liver necrosis. The attenuated neurotropic strain produces, as a rule, a mild systemic infection. Occasionally the monkey develops a fatal encephalitis after the termination of the systemic infection. It would appear that the immunological composition of group B viruses has no relation to their virulence and tissue affinity. The factors determining virulence appear to be quite distinct from the factors determining the immunological make-up.

Limited electron-microscopic studies indicate that group B viruses are spherical particles. Recent biochemical studies with this group show that these agents can be inactivated by the proteolytic enzymes, trypsin, chymotrypsin, and papain. Clear evidence that the inactivation results from the direct action of the enzymes on the virus is a good indication that the virus particle is covered with a protein coat. The antigenic analysis, by antibody adsorption, is thus presumably the analysis of the protein coat. Proteases have

no action on group A agents. It is therefore possible by biochemical means to show marked differences between group A and group B arthropod-borne viruses. It will be recalled that these groups were established entirely on immunological grounds.

It is becoming clear that the study of the arthropod-borne virus infections is an unexpectedly large field. The number of these agents is steadily increasing. A conservative estimate is that 75 distinct viruses known or suspected to be arthropod-borne are now under investigation. A complete knowledge of these viruses and the infections they produce requires the cooperation of scientists throughout the world. The studies of clinicians, epidemiologists, virologists, biochemists, pathologists, zoologists, and botanists are all essential for complete understanding of these agents. The study of the distribution and incidence of arthropod-borne viruses is basically an ecological one. It is the study of the infections acquired by man and his domestic animals as they have invaded the various regions of the world.

#### AGRICULTURE

Now one of the longest continued technical assistance projects operated by an American agency, the agricultural program of The Rockefeller Foundation is entering its seventeenth year. Begun as a one-man venture early in 1943 in Mexico, the program now employs 38 agricultural scientists who are stationed as resident staff in four different countries. For support of the agricultural operating program and closely related activities, the Foundation appropriated \$1,922,400, bringing to \$10,266,798 the total appropriated by the Foundation for its agricultural operating program.

In Mexico, Colombia, and Chile the program is conducted through cooperative, jointly supported research and training agencies in the respective ministries of agriculture.

In India, where operations began early in 1957, the Foundation cooperates with the Ministry of Agriculture and the Indian Council for Agricultural Research. Members of the resident staffs in Mexico and Colombia also serve as consultants for a cooperative wheat improvement project in Ecuador and for corn improvement programs in Panama, Costa Rica, Nicaragua, Honduras, El Salvador, and Guatemala.

From the first, the Foundation's operations in agriculture have been focused on food plants rather than on cash or export crops, with the aim of increasing the production of the foods upon which the local populations chiefly depend. Sufficient experience in operating techniques has been acquired to assure that the Foundation pattern of operating program can be expected to make significant contributions of measurable economic importance to the countries and areas concerned. A spectacular example is the record in Mexico, where chronic deficits in wheat and corn production have been largely wiped out and significant progress has been made in the improvement and increased production of other basic food crops.

Foundation operations have demonstrated that an excellent way to train a local cadre of professional scientists is through in-service experience in research projects directed toward the economic improvement of their own countries. This method concentrates effort and attention on scientific methodology, emphasizes the country's basic agricultural needs, and enjoys the motivational advantage of national pride and patriotism. Many of those who come through such a training program successfully can also profit from postgraduate training abroad, returning to render greater service to local agricultural progress. In the countries where the Foundation has operating programs, its fellowship and scholarship plans are closely tied in with them.

Success with the improvement of key food crops stimulates research on related crops. The early work in Mexico and Colombia on corn, wheat, and beans led to the setting up of new projects on crops such as sorghums, soybeans, forage crops, legumes and grasses, potatoes, tomatoes, peppers and other vegetables, and on poultry and dairy cattle. These result in greater diversification of rural diets, improved land management, and better economic opportunity for an increasing number of farmers. In all the programs, the recommendations resulting from research projects have always been formulated with regard to economic cost factors. More recently, the projects are being studied more formally from the point of view of agricultural economics, with the expectation of obtaining valuable data which can be applied in improving farm practices and benefiting farm incomes.

#### *Effectiveness as Demonstrations*

The influence in neighboring countries of a research and training program of the Foundation pattern is one of its most striking characteristics. The improved plant varieties, especially of corn, wheat, and potatoes, developed in Mexico, for instance, and the more effective agronomic methods devised for their use, have paved the way for improvements in crop production in other countries with similar climates and topography. The programs in Mexico and Colombia have continuously poured into other countries improved methods, materials, and ideas which have greatly facilitated the establishment of new research programs and have expedited their progress.

This influence is also notable in the fact that the existence of information, materials, and advice has stimulated the establishment of numerous local projects and programs by neighboring countries, as in Peru, Brazil, and Venezuela.

Plant materials developed in the Latin American programs have also proved useful in India, Indonesia, the Philippines, Japan, Kenya, Nigeria, and elsewhere. A further obviously noticeable influence is in the invitations received by the Foundation to establish operating programs. The invitations from Colombia, Chile, and India all stemmed directly from observations of the original work in Mexico.

Young scientists and technicians in the region who may not have the language mastery or academic preparation for study in the United States or Europe can participate in an active research program at one of the operating centers and thus secure a type of advanced training usually not available in their own countries. The location of the regional centers in countries with similar cultural and social backgrounds is a further advantage for the trainees. These young men, Foundation experience in Mexico and Colombia has shown, return with remarkable consistency to their own countries to work more effectively and often to stimulate the establishment of research projects at home.

Operating programs give valuable field training for technical assistance personnel. The rapid progress of each succeeding Foundation operation has been possible only because of the availability of competent individuals whose experience in the older programs has given them the knowledge and skills essential for the success of the new undertaking.

Rockefeller Foundation operating programs in agriculture seem also to be serving as demonstrations of successful techniques which might be applied in other technical assistance programs. A constant stream of visitors from international organizations and scientific institutions flows through their headquarters and experiment stations, especially those in Mexico. A number of people connected with assistance agencies have spent longer periods in direct

association with Foundation project leaders in the field. The Foundation itself has made grants to enable educators and investigators from the United States and elsewhere to spend from one to several months in Mexico or at the other installations. These visits, among other things, have given many university professors and administrators a better idea of the background from which some of their foreign students come.

That significant accomplishments in foreign technical assistance programs are possible with but modest investment of funds is still another element demonstrated by the Foundation's pattern of agricultural operation. As already mentioned, the total sixteen-year expenditure has been only slightly over ten million dollars.

### *Mexican Agricultural Program*

In Mexico the Office of Special Studies of the Ministry of Agriculture and Animal Industry, jointly staffed and supported by the Foundation and the Ministry, maintains a library, information service, and administrative offices in Mexico City. The central experiment station and laboratories adjoin the National School of Agriculture at Chapingo, 22 miles from the capital. The office also operates three regional experiment stations and cooperates with a number of special-agency stations.

A vigorous program of research on poultry and tropical food crops is in progress at the Cotaxtla station near Veracruz and at the substation on the Yucatán peninsula. The Northwest Research Center in Sonora emphasizes work with wheat and other small grains, chiefly under irrigated conditions. In the Bajío, Mexico's "corn belt," La Cal Grande station has a full complement of projects on food crops and is also the scene of important work in tillage practices.

The results of the office's wheat breeding in Mexico make it very apparent that as improvements are made in the varieties and as yields increase, other factors begin to limit yields. For example, denser plant populations favor the development of insect infestations and disease. Last year, for the second time in the past three years, unprecedented aphid attacks on the dense stands of wheat in the Bajío caused heavy reductions in the harvest. In other important wheat producing areas, lodging seriously reduced yields. To increase the lodging resistance of wheat by shortening straw length and increasing straw strength, an intensive crossing program with the Japanese dwarf varieties has been initiated.

The greatest problem in corn improvement continues to be the breeding of hybrids or improved varieties for the vast area in Central Mexico where corn is grown under natural rainfall conditions. The altitude of this region ranges from about 4,000 to more than 9,000 feet and rainfall varies from only a few inches in dry years to more than 40 inches in good years. Although some excellent hybrids developed for these conditions are now in commercial production, some of the new synthetic varieties (improved open-pollinated varieties combining various phenotypically similar lines) will probably prove more practical under average farming and rainfall conditions. One synthetic (V-10) has been released for the high valleys of the Central Mesa. Others are needed for the lower valleys and for the Bajío.

In the past year the Office of Special Studies inaugurated new programs in agricultural economics, barley improvement, and range management. The agricultural economics section, like those more directly concerned with the improvement of basic food crops, will carry on both research and training. The barley section was organized at

the special request of the Minister of Agriculture. Though barley is in great demand in Mexico, its production has fallen off, in part because the rust-resistant varieties of wheat developed by the Office of Special Studies have tended to supplant it as a summer crop in the high mountain valleys.

The Chihuahua Livestock Union has made available for studies of range improvement and management an experimental ranch of about 2,500 acres. The range improvement program, under the technical direction of the forage crops specialists of the Office of Special Studies, is developing in conjunction with the new School of Animal Husbandry at the University of Chihuahua. It represents an important attempt to combine research and teaching in the livestock field in Mexico.

### *Colombian Agricultural Program*

In Colombia, all research and experiment station management are centralized in D.I.A., the research department of the Ministry of Agriculture, of which the jointly supported Office of Special Research is a unit. The main office of D.I.A. is in Bogotá, and the central laboratory and experiment station, Tibaitatá, is near that city. A complete coverage of the agricultural regions of the country is provided by a well organized system of substations, ranging from one in the tropics a few yards above sea level to one for potato testing at an altitude of approximately 14,000 feet. The process by which increasing responsibility for the work is turned over to Colombian scientists is also evident, though not yet to the degree possible in Mexico.

Most of the improved varieties of food plants developed by the Office of Special Research are released to a special agency within the *Caja de Crédito Agrario, Industrial y Minero* (the national bank for agricultural credit)

for increase and distribution. This cooperative arrangement, originally covering only wheat and corn, has been extended to include beans and potatoes. The *Caja* now has five modern, well-equipped seed-processing plants—four in the important wheat producing regions of the country and one for corn and bean seed in Palmira—and plans to build additional facilities for other areas.

The farmers of Colombia have not only bought all the improved seed produced but consistently want more than can be supplied. Since the seed increase and distribution program began about four years ago, official records indicate the farmers have planted 1,670 tons of improved corn seed, 2,050 tons of improved wheat seed, and 850 tons of improved barley seed, with resultant increases in yield of 60,200 tons for corn, 6,200 tons for wheat, and 4,100 tons for barley. These figures indicate only a part of the impact of the program in Colombia. It is known, for example, that farmers sell seed of the better varieties from their own harvests to their neighbors, so that the seed purchased from the official distribution agency represents only a small percentage of the total amount planted each year.

#### *Chilean Agricultural Program*

In Chile, though the country is under heavy economic handicaps, the government has increased its appropriations for the support of the cooperative program. Approximately \$2,000,000 is being invested under U.S. Public Law 480 in the development of major research stations at Santiago and at Temuco. The cooperative program is now centered on the improvement of wheat production and on forage crops research.

A great many wheat lines from Mexico and Colombia demonstrated good resistance in their second screening to the races of stem rust prevalent in Chile. In addition, pre-

liminary yield trials have suggested that rust-resistant lines of good agronomic type from several of the Mexican and Colombian crosses tend to outyield the popular, high-yielding but rust-susceptible local wheat Menflo.

The program of forage and pasture improvement in Chile has been divided into three parts: forage breeding, forage management, and forage utilization. The work in forage breeding includes forage introduction, selection, and breeding, and was begun in April, 1957.

### *Indian Agricultural Program*

The Indian program differs somewhat from the others in that it includes direct connection with a graduate school of agriculture and the correlation of the food crop research projects with the research and training activities of the school. The curriculum of the Indian Agricultural Research Institute, near New Delhi, is being gradually extended to cover the requirements for Ph.D. work in several fields which will meet the most exacting international standards. Building plans and library improvements necessary for the new curriculum are in process of realization.

The Indian program, activated early in 1957, will have four Foundation staff members in residence by the end of its first twelve months of operation. The headquarters of the crop research projects, which are planned to cover maize, sorghum, and millet, are at the Agricultural Research Institute. Other main stations and substations to represent the major agricultural regions of the country are rapidly being put into operation. The maize improvement scheme has completed a season of variety trials and is ready for substantial expansion. Though maize is now planted on only a small fraction of India's arable acreage, its increased production for both human and animal food is an important

objective of the government's agricultural plan. The work on sorghums began in the winter of 1957-58.

### *International Projects*

All the local programs cooperate in international projects. Those in Mexico and Colombia have participated in the project of the National Research Council for the preservation of indigenous varieties of corn by systematically collecting samples of every extant variety in the High Andean region, Central America, and Mexico. The collections are maintained as viable seed by cold storage and by replanting as necessary at the central experiment stations at Bogotá, Colombia, and Chapingo, Mexico. The analysis and classification of the Colombian and Central American collections have been completed and the National Research Council has in press the two reports, *Races of Maize in Colombia* and *Races of Maize in Central America*. A similar report, *Races of Maize in Mexico*, was published several years ago.

All three Latin American units are collaborators in the international wheat rust nursery of the U. S. Department of Agriculture. The state experiment station at Toluca, Mexico, through a project directed by a Rockefeller Foundation staff member, has become an international testing center for resistance to the late blight disease of potatoes. In 1957 more than 10,000 seedlings from potato breeders in practically every potato growing country of the world were tested at Toluca and the data on resistance transmitted to the breeders. In addition to such formal projects as these, the units cooperate with many individuals and agencies on an informal basis through the exchange of materials and information.

The Mexican program was co-host in 1957 to the fifth annual meeting of the Caribbean Section of the American

Society for Horticultural Science, attended by 85 horticulturists from the Caribbean area and the southern United States.

## Organizational Information

### MEETINGS

The annual meeting of members of the corporation and a regular stated meeting of the Board of Trustees were held on April 3; a stated meeting of the Board of Trustees was held on December 3 and 4. Six regular meetings of the Executive Committee of the Trustees were held to take actions within the general policies approved by the Board.

### TRUSTEES

At the annual meeting of members of the corporation on April 3, two new members and Trustees were elected. Mr. Benjamin M. McKelway, editor of the *Evening Star*, Washington, D.C., and a director of the Associated Press and trustee of George Washington University, was elected to succeed Dr. Robert G. Sproul, President of the University of California, who retired on June 30, 1956. Dr. Richard Bradfield, professor and until recently head of the Department of Agronomy at Cornell University, was elected to succeed Dr. William I. Myers, Dean of the New York State College of Agriculture, who retired on June 30, 1957.

At their meeting on December 3, 1957, the Board of Trustees elected Mr. Lloyd D. Brace to succeed Mr. Arthur Hays Sulzberger, Chairman of the Board of *The New York Times*, who retired on June 30, 1957. Mr. Brace, President of the First National Bank of Boston, is a Life Trustee of Dartmouth College, a Member of the American Academy of Arts and Sciences, a Trustee of the Massachu-

setts General Hospital, and a Life Member of the Massachusetts Institute of Technology.

At the annual meeting of members on April 2, 1958, Mr. Arthur Amory Houghton, Jr., and Mr. George Barry Bingham were elected to membership. Mr. Houghton is president and director of Steuben Glass, Inc., and vice-chairman of the Philharmonic-Symphony Society of New York, director of the Empire State Foundation and of the Fund for the Advancement of Education, and trustee of the Metropolitan Museum of Art, the New York Public Library, and the Institute of International Education. Mr. Bingham is president and editor-in-chief of the Louisville, Kentucky, *Courier-Journal and Times*, and is also a director of Farrar, Straus and Cudahy, Inc., and of the American Press Institute, a trustee of Berea College, Kentucky, and overseer of the University of Louisville.

#### OFFICERS AND STAFF

Mr. H. Malcolm Gillette, successively Assistant Comptroller and Comptroller of the Foundation since December, 1925, became Assistant to the President on May 1, 1957. Mr. Rowe S. Steel, formerly Assistant Comptroller, became Comptroller, and Mr. John Greenfieldt and Mr. John H. Grevers were named Assistant Comptroller and Assistant Comptroller and Chief Accountant, respectively. Miss Katharine E. Oster, Assistant Secretary of the General Education Board, became also Assistant Secretary of the Foundation on April 3, 1957.

Several new appointments were made for the various programs during 1957. These were: Dr. Robert F. Chandler, Jr., formerly Assistant Director, as Associate Director for Agriculture; Dr. John Maier, formerly Assistant Director, as Associate Director for Biological and Medical Research; Dr. Guy S. Hayes, formerly field staff member, as Assistant Director for Medical Education and Public

Health stationed in Baghdad, Iraq; Dr. John H. Janney, formerly field staff member, as Assistant Director for Medical Education and Public Health stationed in Santiago, Chile; Dr. Virgil C. Scott, Assistant Director for Medical Education and Public Health; Dr. Kenneth W. Thompson, formerly Assistant Director, as Associate Director for Social Sciences; and Dr. Erskine W. McKinley, formerly Consultant, as Assistant Director for Social Sciences.

The following changes and appointments of field staff were made in 1957: Dr. LeRoy R. Allen became a field staff member for Medical Education and Public Health in New Delhi, India; Dr. Ernani Braga was made a field staff member for Medical Education and Public Health in Rio de Janeiro, Brazil; Dr. Sonja M. Buckley, since January 1, 1957, a temporary staff member for Biological and Medical Research, became a regular member of the staff at the Foundation Virus Laboratories in New York on January 1, 1958; Dr. James E. Halpin, temporarily attached to the Mexican Agricultural Program, was assigned to the Chilean Agricultural Program; Mr. Fred W. Knipe, staff member for Medical Education and Public Health, was reassigned to duties in the United States in connection with the development of a portable insecticide sprayer; and Dr. Kenneth O. Rachie, field staff member with the Mexican Agricultural Program, was transferred to the Indian Agricultural Program.

Dr. Ralph W. Cummings joined the staff in January, 1957, as field director of the recently inaugurated cooperative agricultural program in India.

Several new staff members joined the program in Agriculture during 1957. They were: Dr. Peter R. Jennings, as Assistant Geneticist in Mexico; Dr. Donald L. McCune, as Associate Agronomist in Chile; Dr. Robert Romig, as Assistant Geneticist in Colombia; and Dr. Robert K. Waugh, as Animal Scientist in Colombia.

Dr. Edward F. D'Arms, Associate Director for Humanities, resigned on July 31, 1957. Dr. Lowell S. Gleason resigned from the field staff of the agricultural program on March 31, 1957. Miss Esther M. Hirst, a staff member for Medical Education and Public Health, retired on June 30, 1957. Mr. Estus H. Magoon, also a Medical Education and Public Health staff member, retired on February 28, 1957. Dr. Leo A. Thomas, temporary staff member for Biological and Medical Research, resigned on June 27, 1957.

On April 25, 1958, the Foundation suffered a tragic loss in the sudden death of Dr. Norman S. Buchanan. Dr. Buchanan first came to the Foundation in 1947 as Assistant Director for the Social Sciences. In the period 1950 to 1955 he returned to his professorship in economics at the University of California, and in April, 1955, he was elected Director of the Foundation's program in the Social Sciences. His contribution to the Foundation and to the world of scholarship was a rich one and his loss is deeply felt.

# Summary of Appropriations Account

## FUNDS AVAILABLE

Balance from 1956	\$4,865,516
Income for 1957	23,297,132
Amount transferred from Principal Fund as of December 31, 1957	20,000,000
Unused balances of appropriations allowed to lapse and refunds on prior year grants	1,205,408
	<u>\$49,368,056</u>

## FUNDS APPROPRIATED

Appropriations <sup>1</sup>	
Medical Education and Public Health	\$8,298,260
Biological and Medical Research	5,255,235
Agriculture	5,621,400
Social Sciences	3,570,525
Humanities	10,873,670
General Administration	6,466,710 2,713,116
	<u>\$42,798,916</u>
Authorization for later appropriation by the Executive Committee	104,979
	<u>\$42,903,895</u>
Balance available for appropriation in 1957	6,464,161
	<u><u>\$49,368,056</u></u>

## Principal Fund

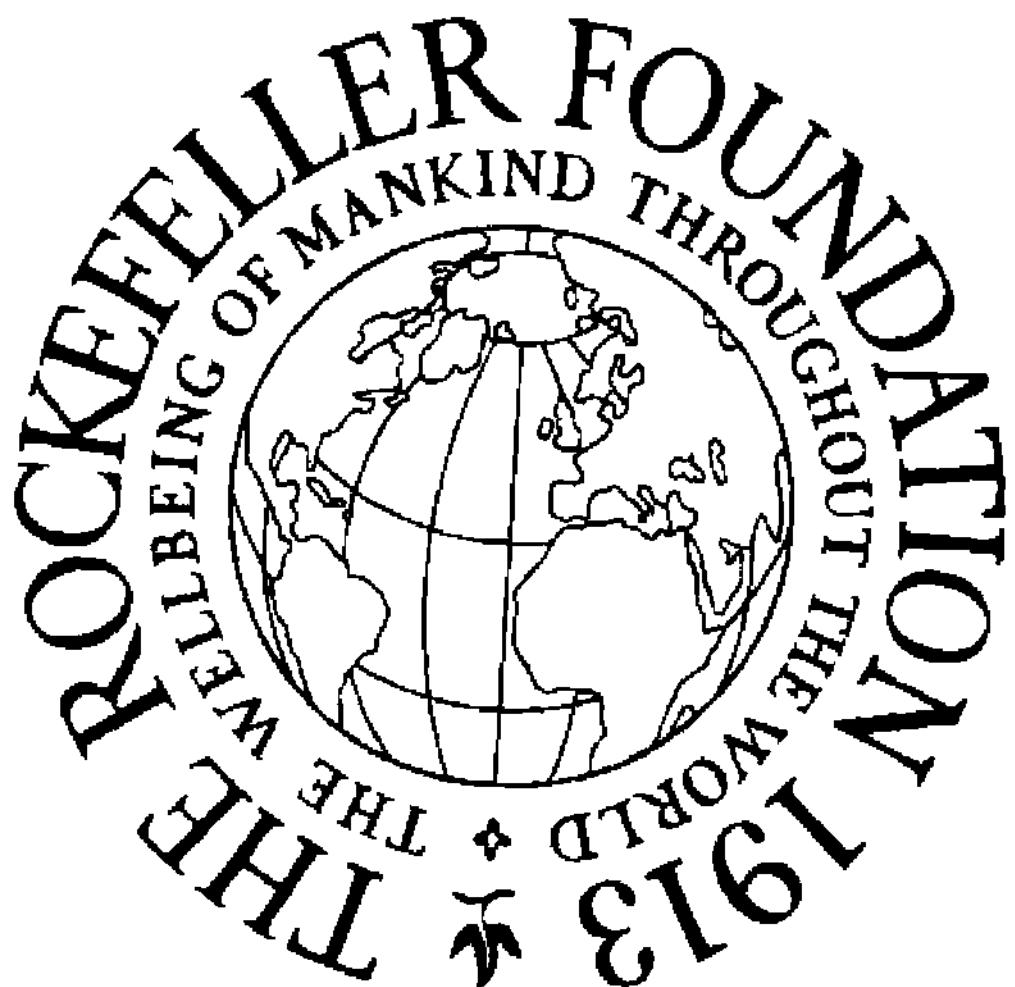
Book value, December 31, 1956	\$162,426,294
Additions during the year	15,000
	<u>\$162,441,294</u>
Less:	
Amount transferred to Income Account	\$20,000,000
Amount by which the proceeds of securities sold during the year failed to equal ledger value	39,809      20,039,809
	<u><u>\$142,401,485</u></u>
Book value, December 31, 1957 (Market value, \$492,365,671)	

<sup>1</sup>These totals include \$650,500 conditionally appropriated but not released until 1958.



## **Illustrations**





## Photograph Excised Here

NORMAN SHARPE BUCHANAN

1905—1958

Assistant Director for Social Sciences 1947-48

Associate Director for Social Sciences 1948-50

Director for Social Sciences 1955-58

The scant attention paid to good design or sound planning in the sprawling, low-density areas between and around our great cities is reflected in this cluttered village center. The Yale University School of Architecture and Design has undertaken a program to study problems of aesthetic design and to develop design possibilities in the urban-rural fringe.



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The varied facilities proposed for the new Lincoln Center for the Performing Arts will permit New York's resident and transient population to see, hear, and enjoy a wider range of presentations in the performing arts than ever before possible. *Above*, the Metropolitan Opera House, as presently conceived by the architects, shown on a scale model. This view, from the northeast, also shows a portion of the new Concert Hall, left foreground, the Juilliard School in the right foreground, and the Theater for Repertory Drama (the free-form building in front of Juilliard). Not shown is the dance theater.



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Brazil's most serious agricultural pest is the leaf-cutting ant, which flourishes particularly in the semi-arid regions of São Paulo and neighboring states. At the Biological Institute of São Paulo, Dr. Mário Paulo Autuori is directing fundamental research on the biology of the organism, with the ultimate purpose of establishing a basis for effective control. This laboratory picture shows leaf-cutting ants in artificial nests.

Students at the School of Agriculture of the Technological Institute and School of Advanced Studies, Monterrey, Mexico, receive both theoretical training and practical experience at the school's large experiment station. In this picture, Ing. Leonel Robles Gutiérrez, director of the school, is conducting a class in the station's poultry plant.



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In March of 1957, a rumor which reached Poona, India, that monkeys were dying in the forest in Mysore State, triggered an all-night 400-mile drive by the experts of the Virus Research Centre of that city. The rumor might mean that the dread yellow fever—the disease which kills monkeys in the jungles of South America—had at last appeared in the crowded countries of the Far East. What the experts found was not yellow fever but a hitherto unknown virus disease, now called Kyasanur Forest disease, which is spread by the ticks on monkeys and rodents, and which causes serious illness and frequently death in man.

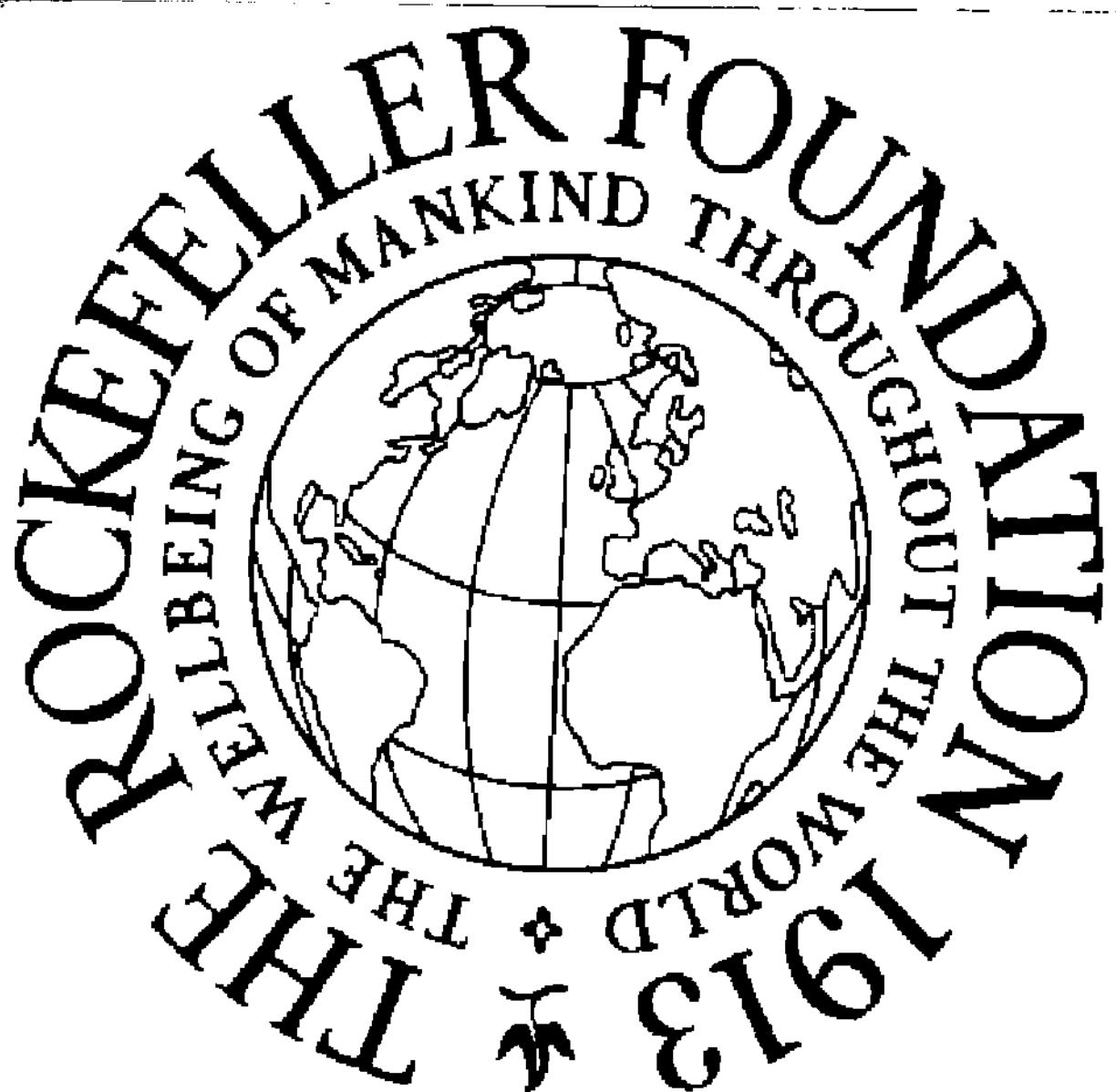


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*Left*, autopsy of a monkey which died from the disease is about to begin. Interested villagers have followed the field party to the edge of the village but stopped some distance away because they fear the nauseating odor of the dead animal which they believe causes the human disease. *Above*, this dense forest with heavy undergrowth is typical of the region. The monkey was found near this spot.



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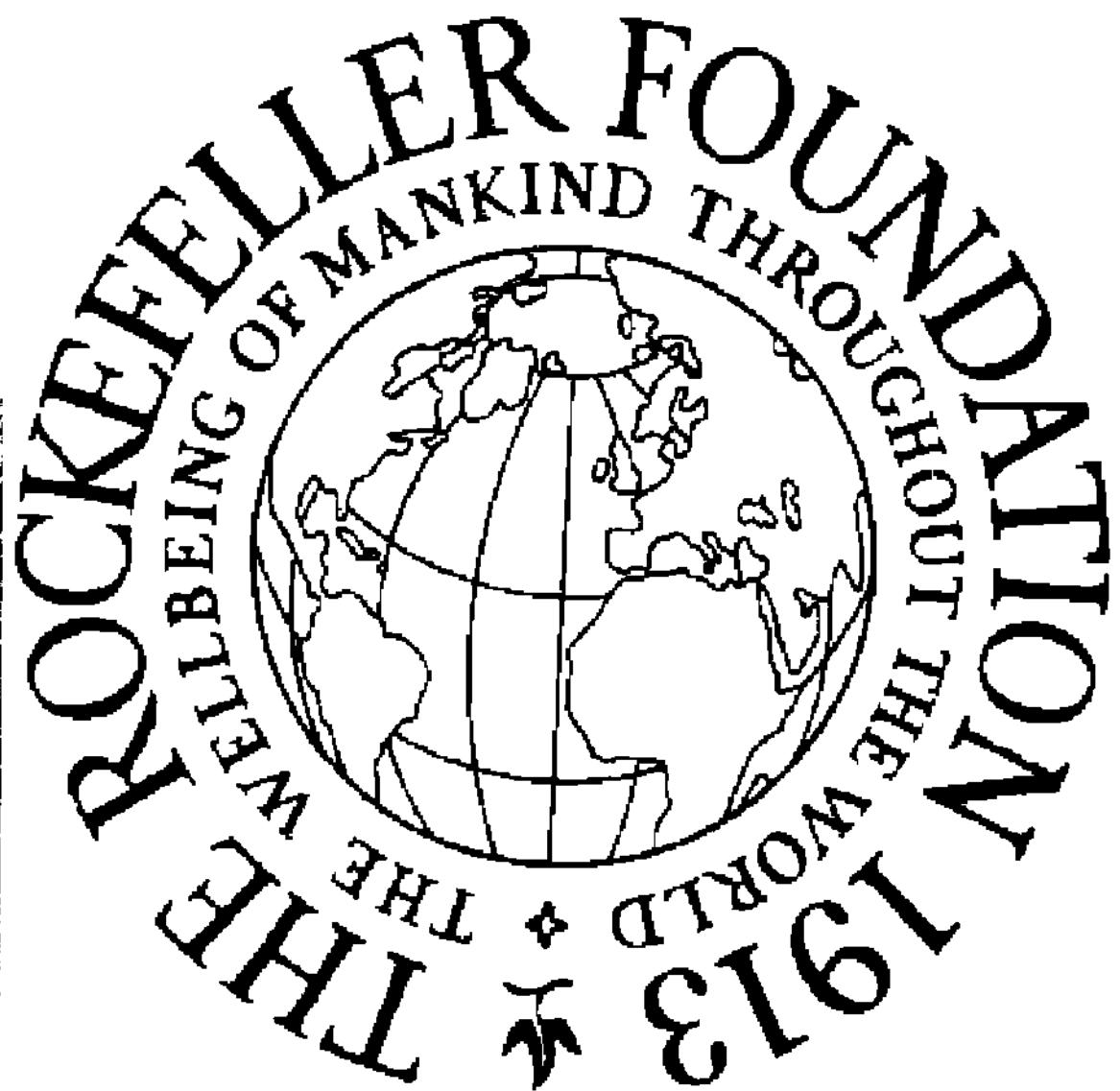
The Khasanur Forest disease epidemic eventually involved an area of several hundred square miles with at least 500 known human cases and over 70 fatalities, before the monsoon rains slowed it down. *Above*, Indian health authorities collect data from villagers. *Right*, a patient too ill to come to the dispensary is examined at home to obtain a blood specimen for possible virus isolation and serological study.

The presence in India of virus experts and teams of field and laboratory technicians meant that the new disease could be promptly studied, identified, and fought. To assist the Indian government's campaign and to pay for appropriate vaccine, which was produced in the United States, the Foundation has appropriated \$100,000. In addition, travel grants have been provided for Indian scientists being trained in this country in vaccine production techniques.



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The Japan Meteorological Agency, Tokyo, is undertaking a program of comprehensive studies of the deep seas, the marine life they support, and their influence on such phenomena as tidal waves and earthquakes. In this picture, taken on one of the vessels maintained by the agency, a container is being lowered to collect samples of deep sea water for study.

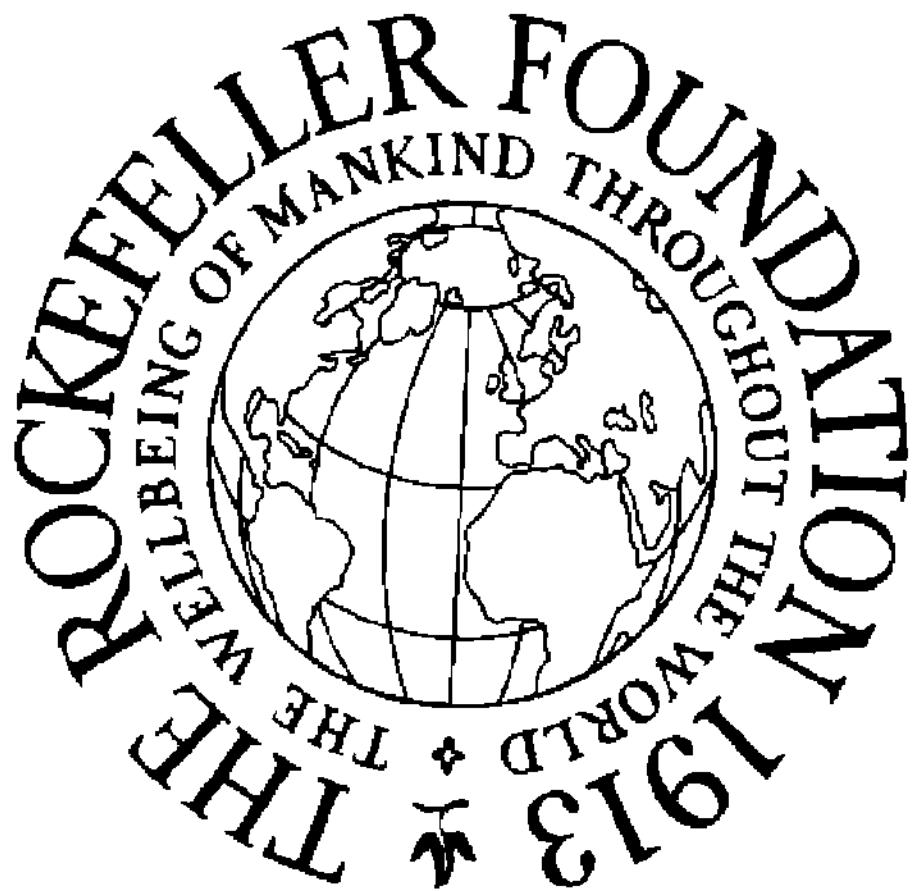


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The Lamont Geological Observatory of Columbia University, one of the world's most important institutions for the investigation of the structure and activity of the sea, has made significant contributions in ocean basin seismology, bottom sediment coring, ocean bottom photography, measurement of deep sea temperatures, and the SOFAR system of position finding by under-water sound transmission. These deep sea starfish were photographed more than a mile below the surface, on the floor of the North Atlantic.



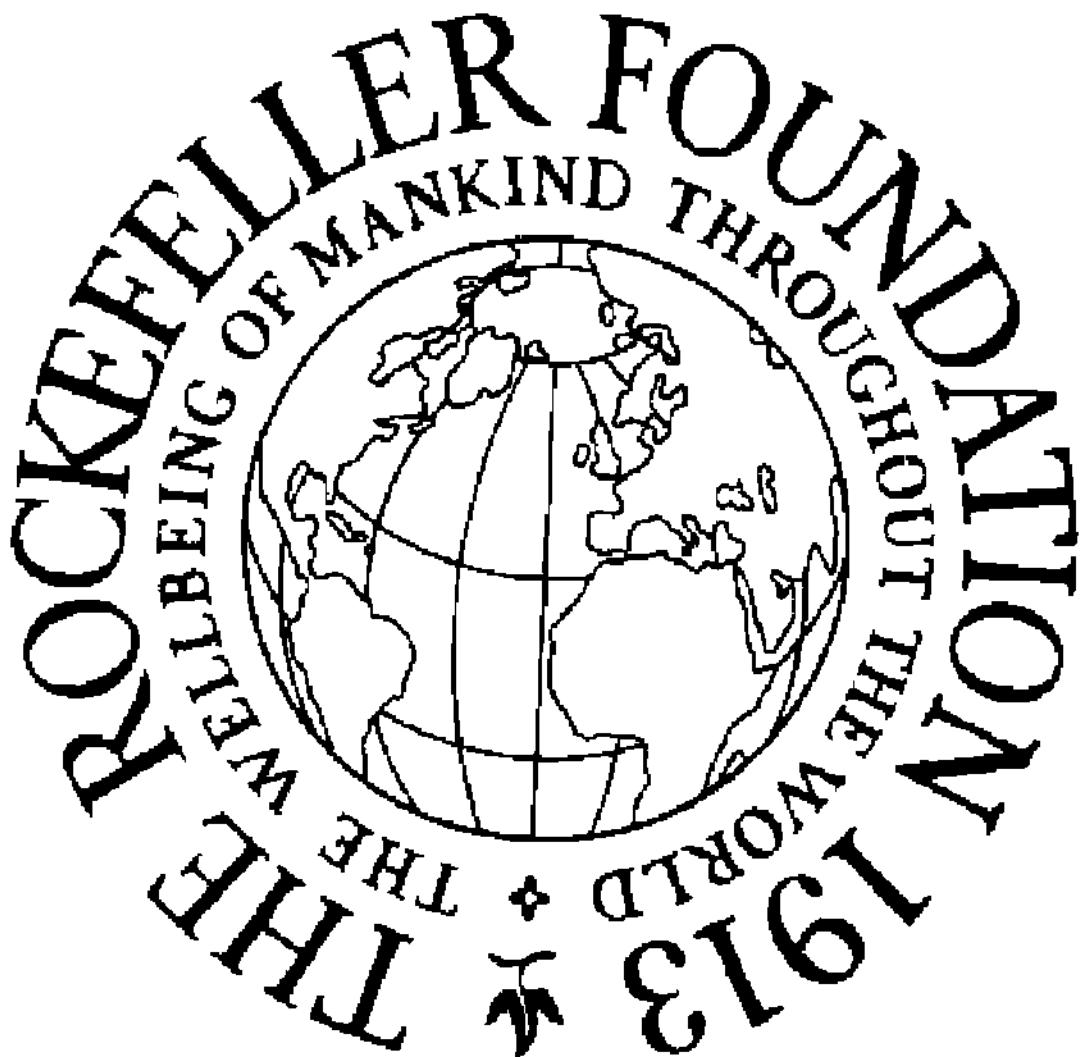
## Photograph Excised Here

A research and training program in the numerous and diverse languages spoken in India today was established a few years ago by the Deccan College Postgraduate and Research Institute in Poona. Descriptive and comparative studies of the country's more than one dozen major contemporary languages are being made by Indian linguists and cooperating American scholars. The group in this picture are analyzing a dialect spoken in South India.

The University of California, Los Angeles, has established a two-part program to improve methods of teaching English as a second language in the Philippines. At Los Angeles, a special course is being offered on the teaching of English with relation to Philippine needs, and in Manila, the Philippine Center for Language Study has been established for research in language instruction. This picture was taken at the center during the course of a meeting of the Advisory Board.



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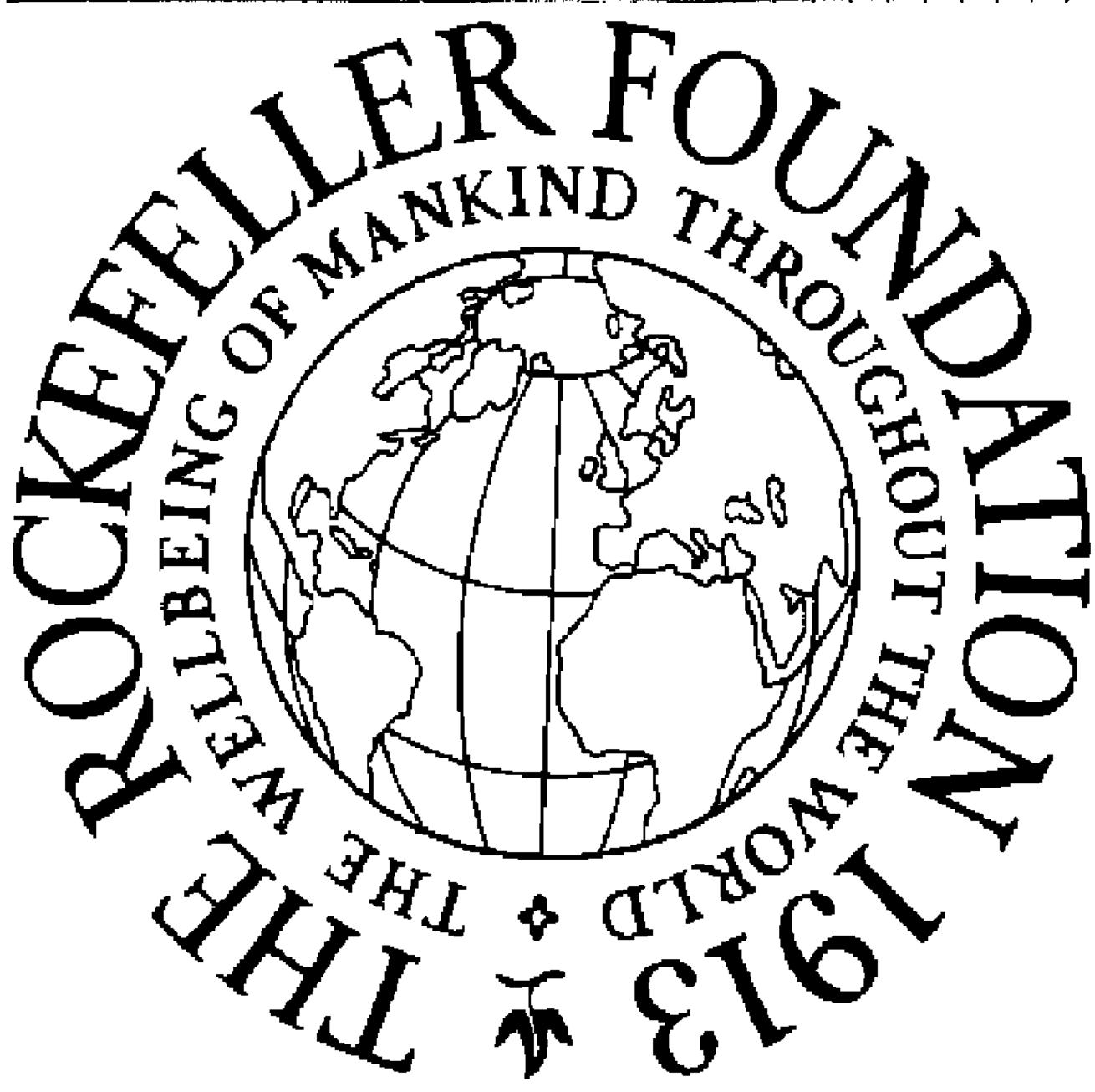
The Institute of Biology and Technological Research, in Curitiba, the capital of the State of Paraná, Brazil, was founded in 1940 for the purpose of conducting scientific investigations related to the economy of the state. A 1957 Foundation grant will be used toward research in experimental pathology and animal and plant biology. *Above*, in the Animal Pathology Laboratory, the lungs of mice exposed to Asian flu are being removed for diagnosis.

As a direct outgrowth of the Foundation's concern for "the public health of nuclear energy," three grants of \$500,000 each were made during 1957 to Harvard University, the Johns Hopkins University, and the University of Pittsburgh, in support of research in radiation health and training of public health experts in nuclear radiation protection. The Harvard Air Cleaning Laboratory, whose program includes work on radioactive materials, has developed a pilot plant for high temperature filtration of nuclear reactor off gases, shown in this picture.



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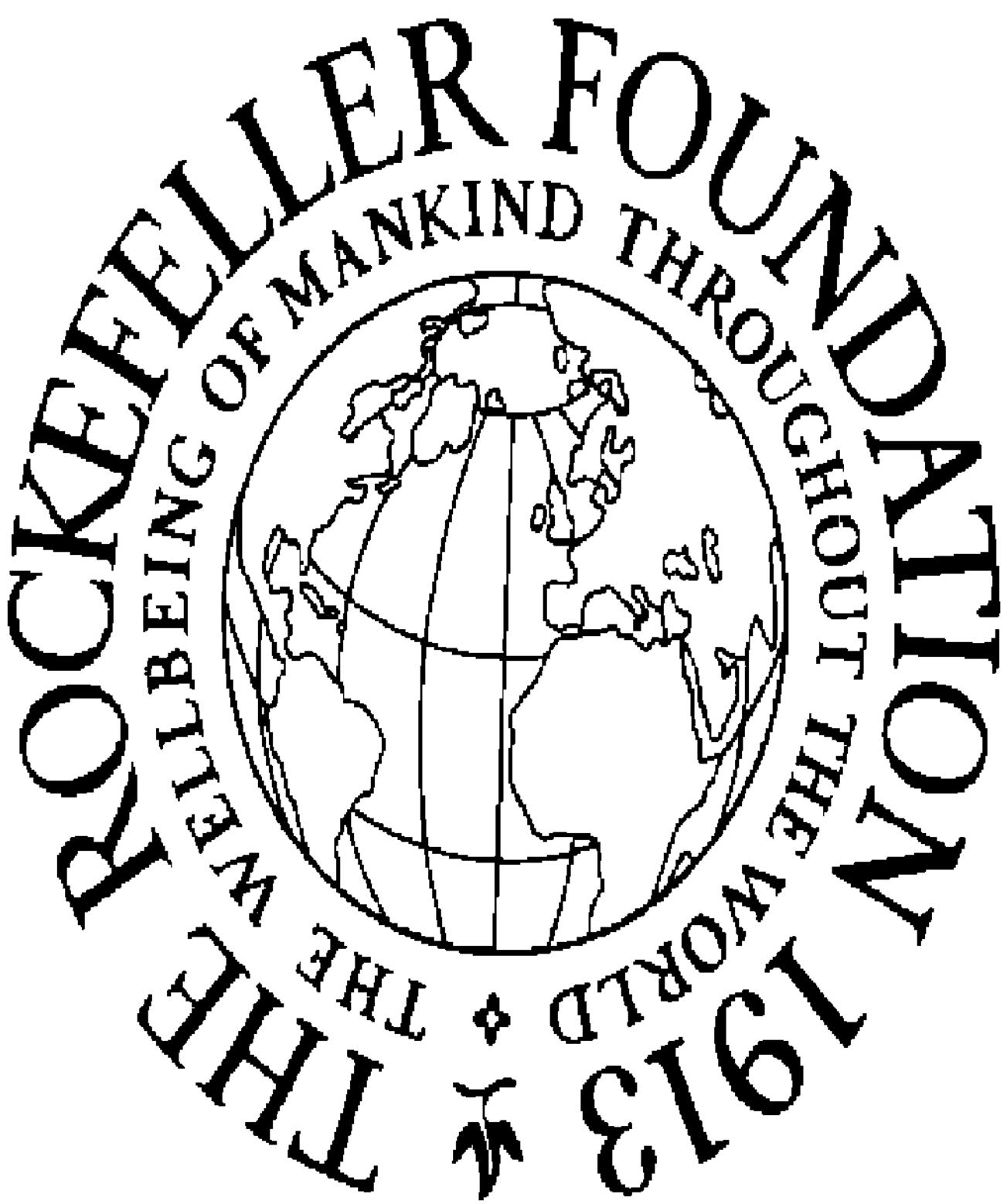
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Glyde Hare

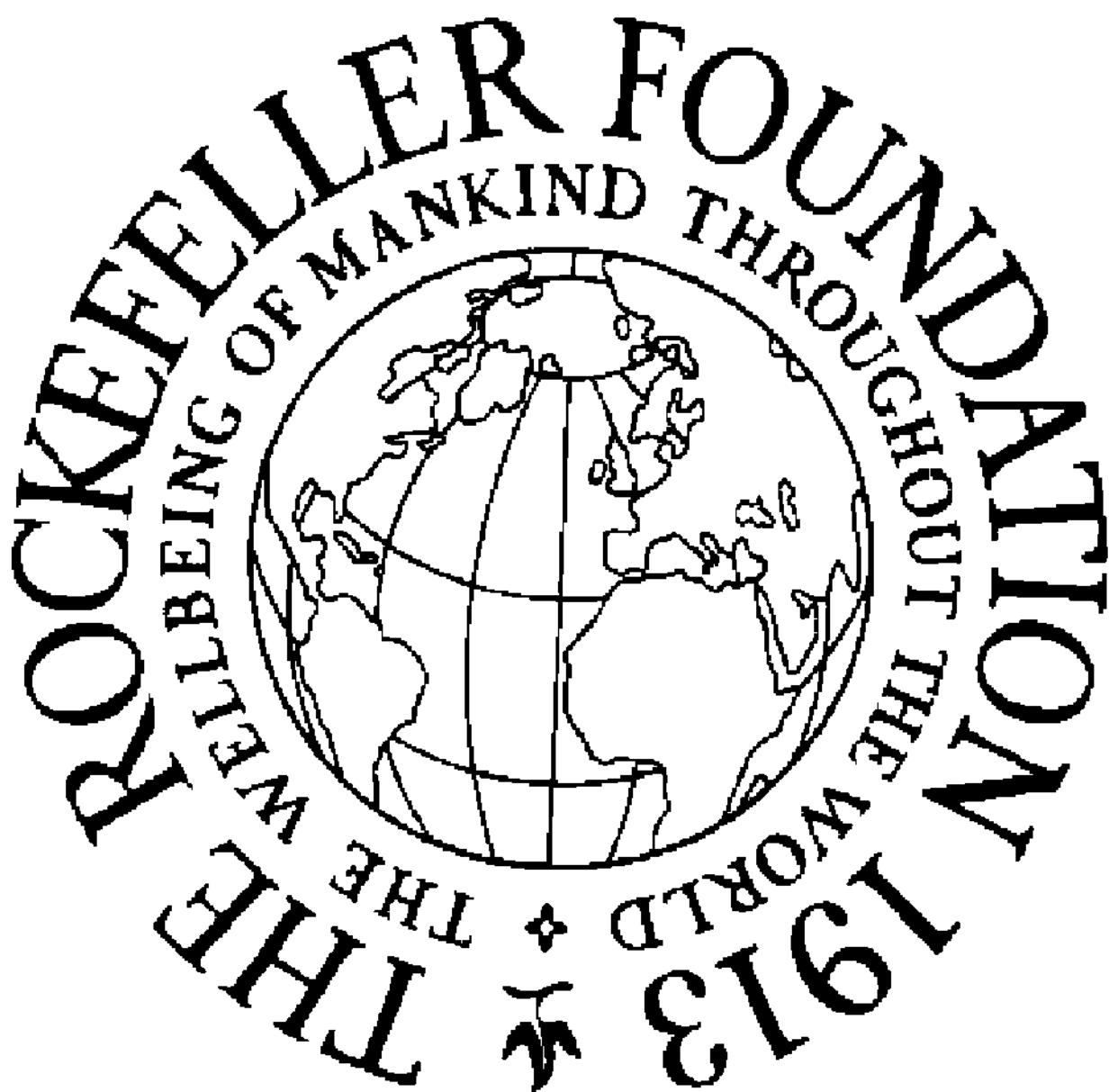
This practical demonstration, part of the University of Pittsburgh program on radiation health, shows the importance of shielding and distance required for the safe handling of radioactive specimens. Film badges



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(attached to coats) measure the total radiation exposure of the individual, while the Geiger counter on the left and the ionization chamber on the right give instantaneous radiation rates. © 2003 The Rockefeller Foundation

The Tulane University School of Medicine, New Orleans, Louisiana, has inaugurated specialized intensive courses in English and the basic sciences for the benefit of foreign students beginning graduate study in the medical sciences. These advanced students of biochemistry from Latin America are working in the general laboratory.

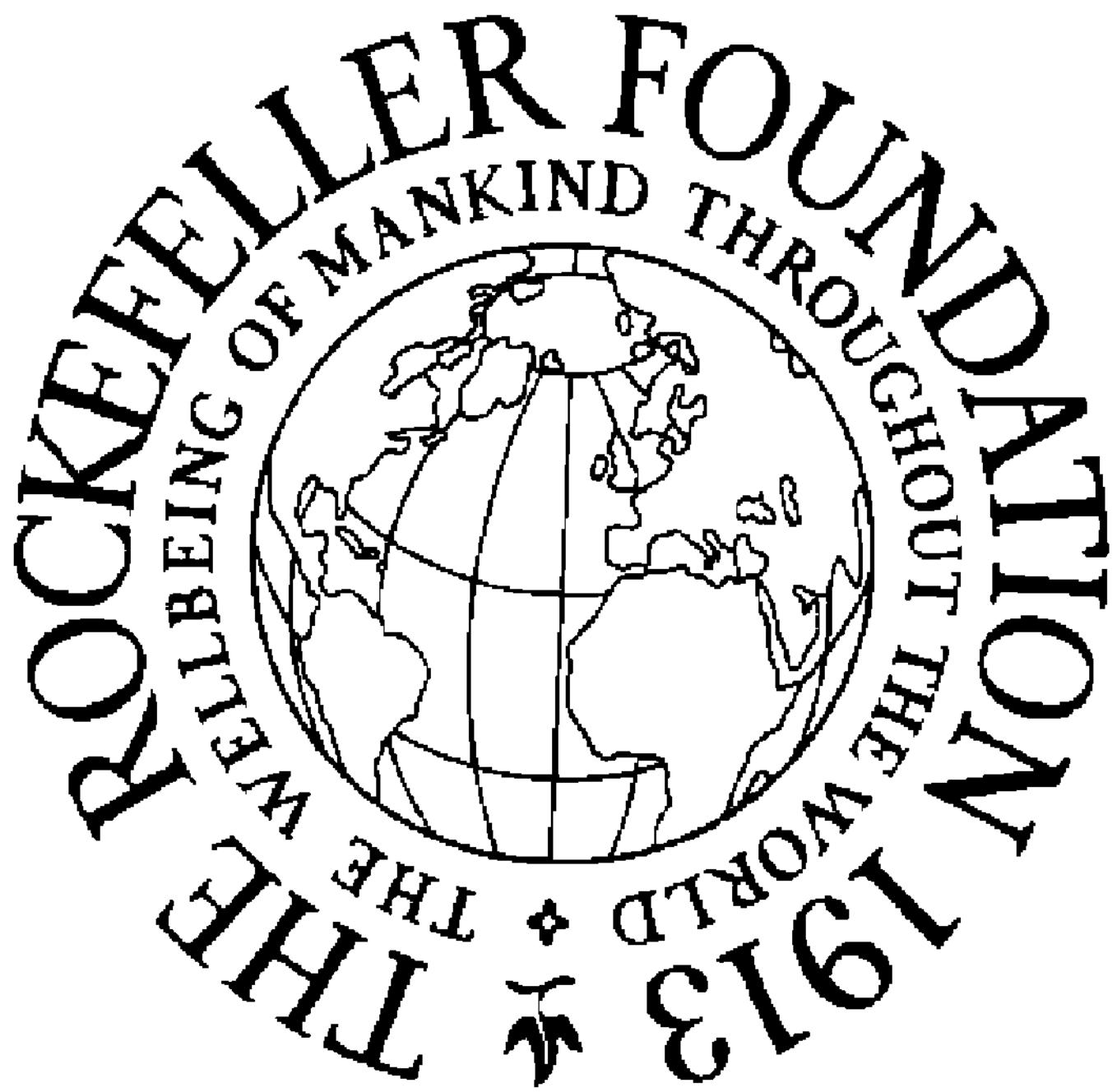


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Founded in 1950, the Faculty of Medicine of the University of Valle, Cali, Colombia, is adapting modern advances in medical education to the pattern of Colombian and Latin American education and culture. The Department of Preventive Medicine and Public Health provides practical experience for student doctors and nurses in a training area in a nearby depressed community. In this picture a nurse and a social worker from the training team note the conditions under which milk is sold.



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The Faculty of Veterinary Medicine of the University of San Marcos, Lima, Peru, stresses research on the diseases that attack llamas, alpacas, and vicuñas—animals unique to the Andean highlands and of considerable economic importance in Peru as well as in neighboring Colombia, Ecuador, and Bolivia. In this picture, Dr. G. Augusto Vallenás, professor of physiology, is measuring the digestive activity of the alpaca's rumen, or first stomach.

Research important to the control of economic pests in Chile is being carried on at the La Cruz Insectorium of the Ministry of Agriculture. Here, a citron melon is being infected with scale larvae in work on one of the country's major crops.



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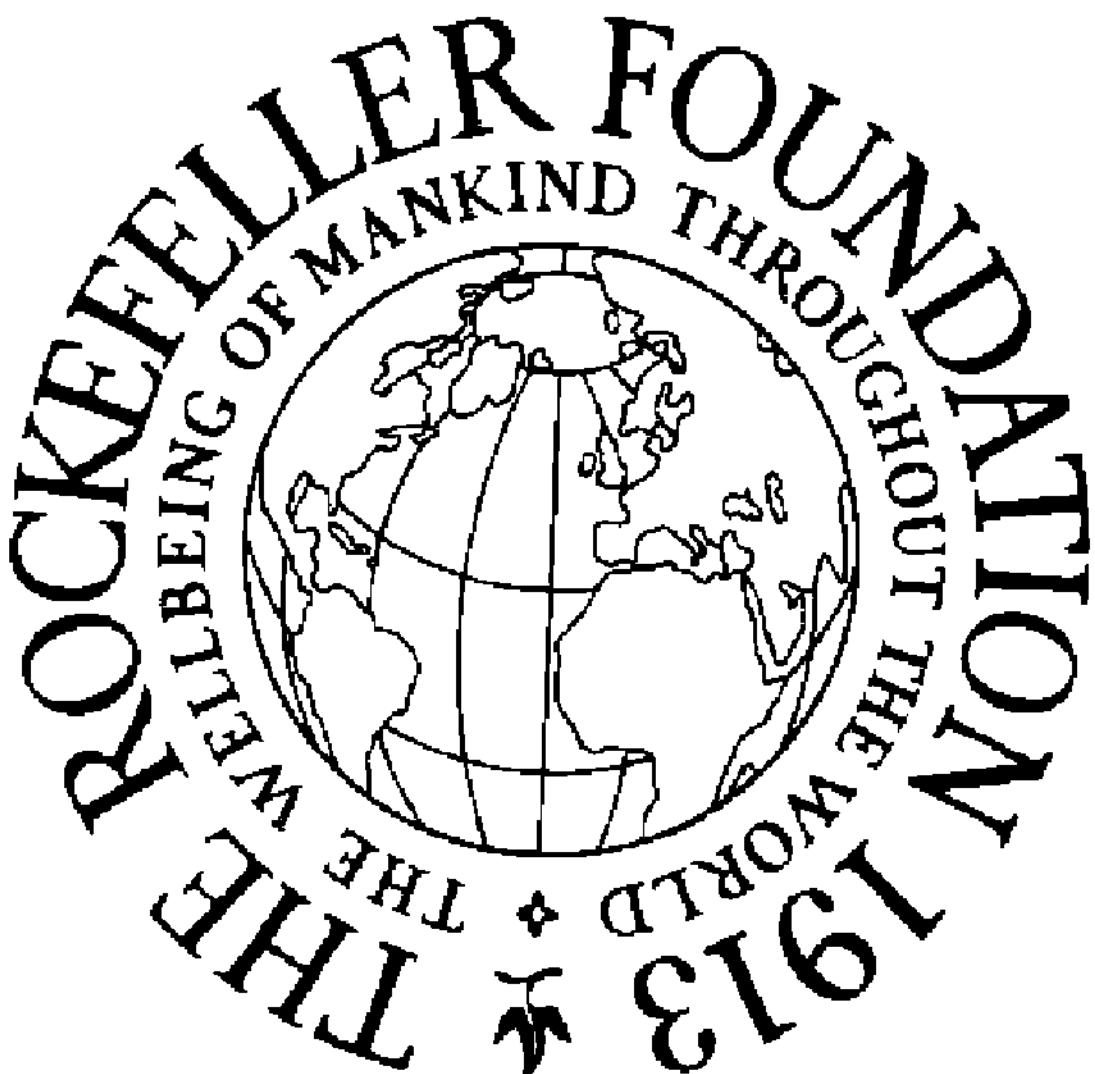


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The agricultural operating program in India, inaugurated early in 1957 at the invitation of the Indian Ministry of Agriculture, is the first of its type in Asia, the first agricultural operation of the Foundation outside Latin America, and the first to have as a component the continuous support of Foundation staff in the development of an educational as well as a research program. The Foundation is working with Indian officials, scientists, and teachers in the organization of a central postgraduate school of agriculture, and is also helping to establish research projects for the improvement of cereals, with initial emphasis on work with hybrid maize, sorghum, and millet. *Left*, agricultural machinery being loaded for shipment to regional research stations. *Above*, women preparing plot markers.



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Both political scientists and practicing diplomats are collaborating in research on the foreign policy of the United States at the Washington Center of Foreign Policy Research, which is affiliated with the School of Advanced International Studies, the Johns Hopkins University. In this picture, taken at a staff meeting, Professor Arnold Wolters, director of the center, is seated behind the desk, and Mr. Paul H. Nitze, chairman of the Executive Committee and research associate of the center, is third from the right.

The accidental discovery in Japan of several series of village tax records covering over 300 continuous years provides entirely new data for the study of the historical relation between feudalism and the evolution of capitalism in that country. The pictures show (*below*) the cover sheet of one of the annual records and (*above*) the first page of an itemized tax list. The discovery was made by Professor Thomas C. Smith of Stanford University while working in Japan with the support of a 1957 travel grant from the Foundation.



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The Institute of Public Administration of the University of the Philippines was established in 1952 as a training center for the Philippines and other Southeast Asian countries faced with public administration problems in connection with their development programs. In addition to offering a full-scale academic curriculum, the institute sponsors research and has issued a number of important publications. Since 1955, both the research and training aspects of the institute's program have received assistance from the Foundation. This picture was taken in the institute library, whose collection in public administration is one of the best in the Far East.

In studying the chemical architecture of the cells of the nervous system, Professor Holger Hydén and his associates at the University of Göteborg, Sweden, have developed new techniques for working on the minute scale required for single cell analysis. Below, an apparatus for the separation, identification, and determination of purines and pyrimidine nucleotides of a single nerve cell. The nerve cells are dissected out one by one, and the ribonucleic acid (RNA) of each cell is extracted and determined; then the RNA is hydrolyzed, placed on a cellulose thread, and the nucleotides separated by microelectrophoresis.

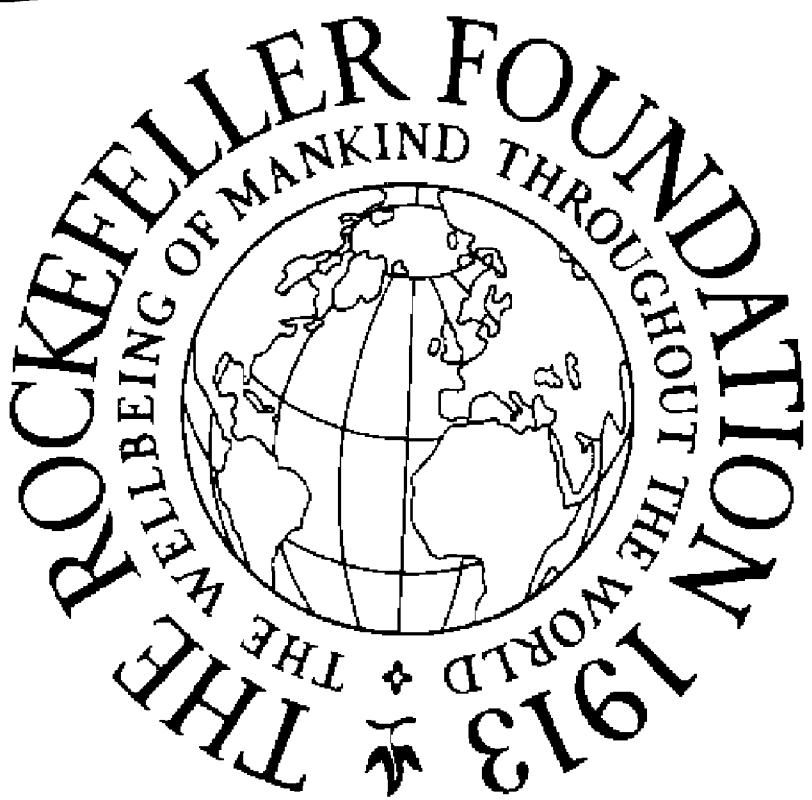


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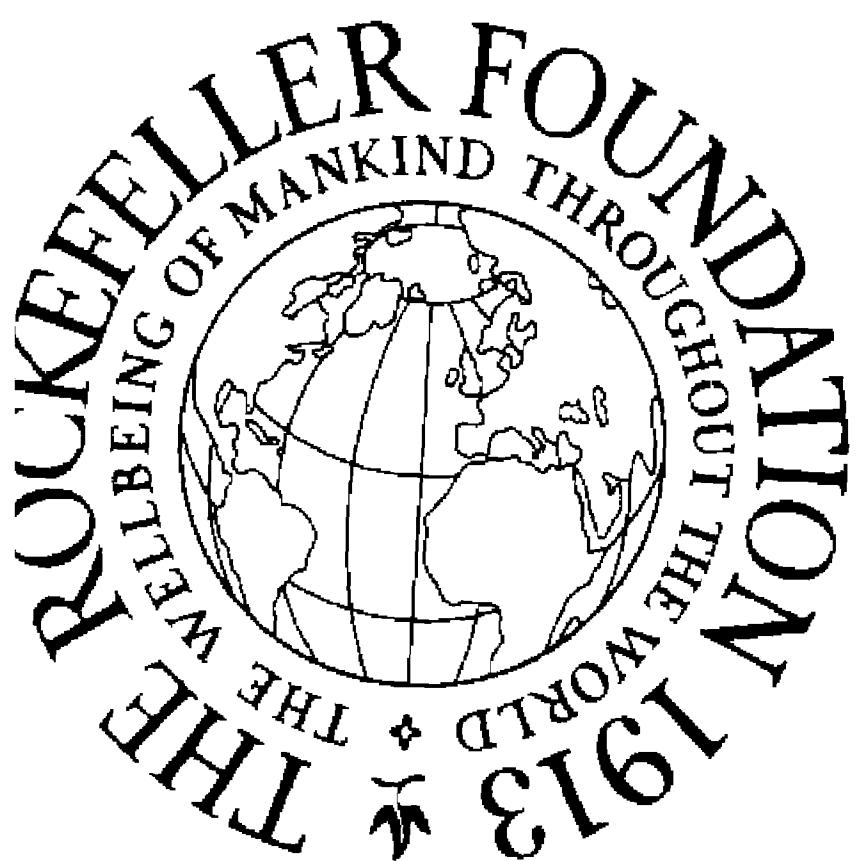
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*Government Press Division, Israel*

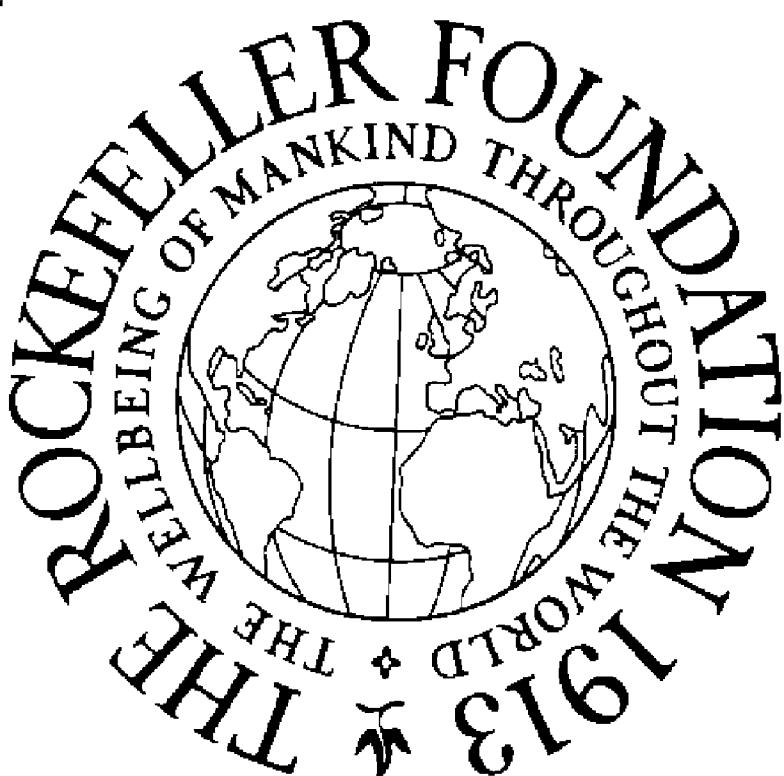
Findings resulting from research on solar energy at the National Physical Laboratory in Jerusalem, Israel, indicate that new materials might be developed for the direct conversion of solar energy to electricity which would be substantially cheaper than the pure substances currently used. One of the laboratory's major achievements has been the development of an almost perfect coating for solar collectors. In this picture, the mirror that is used to reflect sunlight onto the collector is being assembled.



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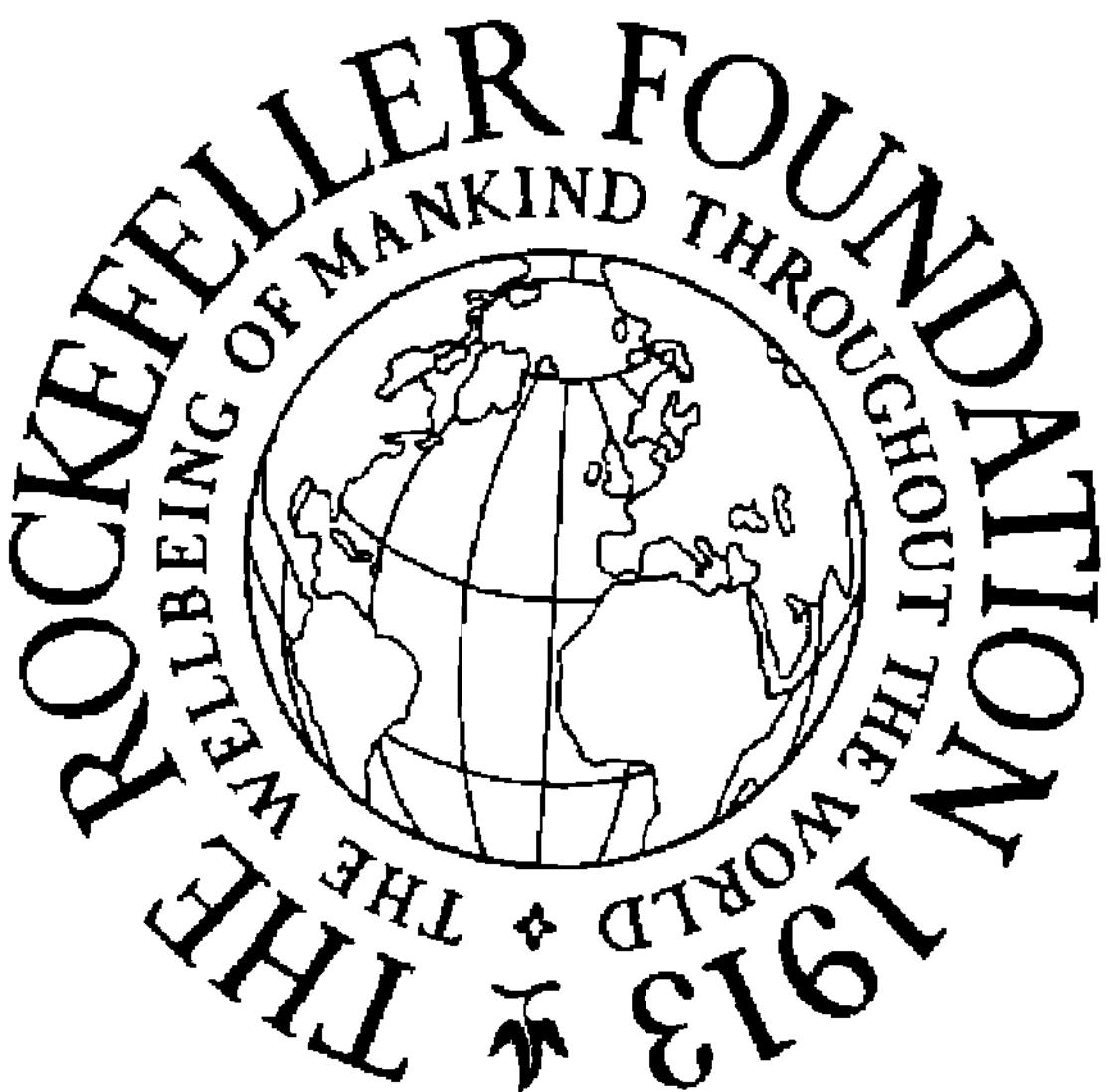
The Institute of Public Administration of the University of the Philippines was established in 1952 as a training center for the Philippines and other Southeast Asian countries faced with public administration problems in connection with their development programs. In addition to offering a full-scale academic curriculum, the institute sponsors research and has issued a number of important publications. Since 1955, both the research and training aspects of the institute's program have received assistance from the Foundation. This picture was taken in the institute library, whose collection in public administration is one of the best in the Far East.

In studying the chemical architecture of the cells of the nervous system, Professor Holger Hydén and his associates at the University of Göteborg, Sweden, have developed new techniques for working on the minute scale required for single cell analysis. *Below*, an apparatus for the separation, identification, and determination of purines and pyrimidine nucleotides of a single nerve cell. The nerve cells are dissected out one by one, and the ribonucleic acid (RNA) of each cell is extracted and determined; then the RNA is hydrolyzed, placed on a cellulose thread, and the nucleotides separated by microelectrophoresis.



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The forage studies of the Mexican Agricultural Program are being concentrated in three large regions of Mexico, each completely different with respect to environment, types of grassland and forage production, and class of livestock. In this picture, taken at the Coataxla Experiment Station located in the tropical Gulf coast area, a forage crop specialist is explaining the characteristics of Merkerón grass to visiting cattlemen.



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## Photograph Excised Here

The Colombian Agricultural Program has established research goals in animal science studies for the entire country by region and species of animal. Land clearing, drainage and seeding, fencing, and construction are under way at the regional stations where animal research is being undertaken. Shown here are the new quarters for the dairy husbandry project at the experiment station, Tibaitatí, near Bogotá.

The unpublished manuscripts of Gabriela Mistral, Chilean poet and Nobel laureate, are being microfilmed exactly as she left them at the time of her death; these include an epic-length poem, *Recado de Chile*, as well as a second volume of *Lagar*, a collection of shorter poems. The film will be deposited in the New York Public Library and the Library of Congress where it will be available to scholars after publication of the first edition. Below, Miss Doris Dana, executrix of Miss Mistral's literary estate, consults with Mr. Hernán Díaz-Arrieta, Chilean critic, writer, and friend of Gabriela Mistral, who will prepare a version of the manuscripts for publication; at the right is Mr. Francisco Aguilera of the Library of Congress. On the bookshelf are a portrait of Miss Mistral, a pair of Chinese porcelain birds that were among her favorite possessions, and a silver goblet, gift of the Colombian poet, Dublé Urrutia, and the subject of one of the poems in *Lagar*.



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**Medical Education  
and Public Health**

**MEDICAL EDUCATION AND PUBLIC HEALTH**

*Major Interests, 1957*

Professional Education .....	\$5,528,235
Medical Care .....	855,500
General .....	18,000
Field Service .....	421,525
Fellowships .....	625,000
Grants in Aid .....	350,000

## MEDICAL EDUCATION

## AND PUBLIC HEALTH

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**I**N ITS PROGRAM in medical education and public health, The Rockefeller Foundation has continued its activity both in the United States and abroad. Within the continental United States, assistance has been given a number of faculties of medicine toward studies of their curricula designed to determine the best orientation for the education of the physician and the most effective means of meeting present and future demands for medical manpower. Medical education, like other types of education, does not have a static pattern but must constantly change in response to the evolving requirements of society; there is considerable latitude for experimentation within the accepted concepts and standards of quality. From these various institutional experimental studies several new approaches to the solution of the medical manpower problem are expected to result. Toward one such experiment at the Johns Hopkins University School of Medicine the Foundation has provided assistance. At Hopkins an attempt will be made to select the medical student earlier in his university career than heretofore, and to permit him to enter a special curriculum of an "honors" character involving, in addition, a substantial increase in the length of the academic year. These arrangements, aided

by increased clinical responsibility in the last year of the course, are expected to achieve a substantial saving in the time required for the medical course with no sacrifice in quality.

A second major undertaking has been encouragement of interdisciplinary programs at an advanced level in the broad health and social aspects of nuclear energy. The atomic energy industry, already a major economic factor in the United States, will inevitably present problems of the most complex character involving concomitantly important aspects of law, economics, public health, sanitary engineering, and social science. To produce the specialists needed for leadership and public administration in the new field requires resources which exist only in the universities of the country; attention is therefore being given, especially by those universities maintaining schools of public health, to a type of postgraduate education which extends across most, if not all, organizational divisions of the institution. It may be expected that public health practice will be modified to meet the changing situation, and also that technological development will be guided by health considerations and social requirements.

Because nursing is inseparable from medicine, assistance has been given to several institutions and organizations which have been trying to improve the content of nursing education through the training of more effective teachers. It is recognized that the realization of adequate nursing services in the United States involves considerations of both quantity and quality. The broadening of the professional capability of teachers of nursing is an essential step in the training of a larger number of nurses devoted to bedside care.

In many countries of the world, medical education presents problems of enormous magnitude which no foreign

agency can pretend to solve. The huge deficits in medical manpower must be met by each country from its own educational resources. Temporary outside help, however, may substantially accelerate the training of highly competent teachers, who will in turn comprise the faculties of medical schools producing the large number of physicians needed. Accordingly, in various countries of Latin America and Asia—but particularly in Brazil, Chile, Colombia, and India—assistance is being given to certain institutions which have undertaken to produce a greater number of qualified teachers in the preclinical and clinical sciences. Direct assistance in the form of grants has been augmented by fellowship awards to young and promising faculty members for study in other countries, and by the establishment of scholarships which make possible a more efficient use of the educational resources within the various countries.

An important component in the development of the educational structure in any country is continuing evaluation of past experience. Studies of the performance of the physician in relation to the pattern of his medical training should give significant measure of those elements most important to the production of a good physician. The Foundation has therefore continued its support of studies seeking to identify those elements in the curriculum and in pedagogy which contribute most to the quality of medical care available to patients. It is recognized that, in addition to the scientific and clinical content of the physician's preparation, the pattern of organization within which he serves the public also possesses crucial importance. Consequently, support has been given to the exploration of ways in which the administrative structure within which the physician operates might be improved, in order that the professional resources of the country may be brought to bear most efficiently on individual medical needs.

## Professional Education

JOHNS HOPKINS UNIVERSITY

SCHOOL OF MEDICINE

In recent years medical educators have become increasingly concerned with the burdens placed on medical schools and medical students by the cost of medical education in terms of both time and money. Under the present system of medical training, the majority of students spend four years in undergraduate work, another four in medical school, and at least two years and often five in clinical service before they are fully effective as responsible practitioners. The economic pressures involved in this protracted course of study have been sufficient to deter considerable numbers of otherwise promising students from entering the profession. Yet, more physicians are urgently needed to help fill the widening gap between the number of doctors available and the demands for health care created by a population growing both in actual numbers and in health awareness.

The Johns Hopkins University, long a pioneer in medical education, has devised a new pattern which, by shortening by about two years the time required for medical training, should both reduce the pressures of medical education and increase the amount of medical care available to the public. Under the new system, the student will devote most of his first two years in college to the humanities and social sciences, and begin his premedical training in his junior year with intensive instruction in advanced chemistry, mathematics, elementary physics, genetics, and elective subjects. In the succeeding three years the curriculum will include redesigned courses in such related fields as psychology, anthropology, and the philosophy of science. At the end of the second year in medicine, students will be eligible for an A.B. degree given by the Faculty of Philosophy.

Another feature of the new Johns Hopkins program is the reorientation of the usual senior year in medicine to permit the student to follow what is essentially a rotating internship. Students will live in the hospital and assume a larger share of clinical responsibility than under the present system. They will thus be prepared to undertake advanced residency in a single field immediately upon completion of the requirements for the degree.

Johns Hopkins expects to select approximately 20 students for the special medical course, while continuing the majority of medical students in the standard course now offered. For an indeterminate number of years, therefore, two patterns of education will be in operation in what, in all essential respects, will be a controlled experiment. This will permit the continued evaluation of the performance of students in the two systems not only during their scholastic years but also during the subsequent period of medical practice.

To help with the costs of inaugurating the new program, The Rockefeller Foundation has made an outright grant of \$2,500,000 to the Johns Hopkins University, Baltimore, Maryland. The Ford Foundation, the Commonwealth Fund, and the United States Public Health Service are also providing funds for the experimental program.

#### HARVARD UNIVERSITY, THE JOHNS HOPKINS UNIVERSITY, AND THE UNIVERSITY OF PITTSBURGH

##### RADIATION BIOLOGY

Through nuclear war, the testing of nuclear weapons, and the inadequate disposal of atomic wastes, man is now capable of adding dangerously to the inescapable natural radiation present in his environment. Increasing numbers of individuals can be subjected to additional hazards by radioactive therapy, by industrial accidents, or by the han-

dling of the increasing quantities of radioactive materials without proper protection.

The Foundation's concern with the possible threats to living organisms posed by nuclear energy led it to support an independent study by the National Academy of Sciences which would, first, draw together what was then known about the effects of radiation on man, and, second, help identify those questions upon which further research was urgently needed. Six committees appointed by the academy published reports in June, 1956, on the biological effects of atomic radiations from the points of view of genetics, pathology, meteorology, oceanography, agriculture, and the disposal of radioactive wastes. These widely distributed reports were an important factor in drawing public attention to the health dangers of both military and peaceful uses of nuclear energy.

Because of the need for highly qualified experts in the public health of the nuclear age—experts who can bridge the gap between conventional public health and atomic development, and who can help guide that development for public safety—The Rockefeller Foundation in 1957 made grants totaling \$1,500,000 to three leading United States universities. The three schools, Harvard University, the Johns Hopkins University, and the University of Pittsburgh, will each use a \$500,000 grant for training and research programs in radiobiology designed to prepare public health experts equipped to guard civilian populations against the health hazards of nuclear radiation.

Harvard University's School of Public Health has been conducting research since 1947 on radiation problems affecting industry and the public. Instruction on the environmental aspects of radiation started in 1950 as part of the industrial hygiene engineering course and has since expanded in co-operation with several departments of the university.

At Johns Hopkins University, the Thomas C. Jenkins

Department of Biophysics, the School of Medicine, and the School of Hygiene and Public Health will coordinate and intensify their programs in radiation and radiobiology.

The University of Pittsburgh Graduate School of Public Health, through its Department of Occupational Health, has a program of research and teaching which emphasizes the biological effects of ionizing radiation, including the health problems involved in the design and operation of nuclear reactors.

**DUKE UNIVERSITY**

**SCHOOL OF NURSING**

The recruitment of young women into nursing is difficult today partly because of the competition offered by increasing opportunities for women in other fields. At the same time the growing complexity of nursing skills, and the greater demand for nursing services, require the recruitment of large numbers of superior young women. To meet the challenge, nursing educators in recent years have intensified their efforts to provide college courses in nursing that will make the profession more attractive as a career. To the extent that these efforts have been successful, they have solved some problems and created others, among the latter a more acute need for nursing teachers and administrators on an advanced level.

Duke University, for many years one of the principal centers of medical education in North Carolina, is now developing classes at the master's degree level for future nursing educators, administrators, and supervisors. The new curriculum is designed to focus the attention of students on the content of what they will have to teach or supervise in their subsequent careers rather than on the techniques of teaching, and accordingly a large amount of ward experience will be required, along with classes in the basic sciences and

in administration. It is felt that under such a program a student can be acquainted in minimum time with her role in the modern medical team, the complexity of the techniques involved in nursing participation in the team, and the inter-relationships between the team and the patient which relate to the latter's progress in recovery from illness.

Duke will initiate the program by offering a major in medical-surgical nursing to a selected group. As experience is accumulated, courses for the master's degree in all fields of nursing will be offered to larger numbers of students. The present faculty of the medical and nursing schools and additional specialized instructors and administrative personnel will participate in the development of the new curriculum.

Toward the costs of the new Duke program, the Foundation in 1957 made a seven-year grant of \$238,000.

#### UNIVERSITY OF VALLE

#### FACULTY OF MEDICINE

The Faculty of Medicine of the University of Valle, Cali, Colombia, was founded in 1950 by the residents of the area to develop a program in medical education, research, and care that would serve the local region and provide leadership in these fields for Colombia and for Latin America generally. In the years intervening the faculty has made great progress in establishing a curriculum which adapts modern advances in medical education to the pattern of Colombian and Latin American education and culture.

Since 1955 the faculty has cooperated with the seven other medical schools in Colombia in setting standards for medical education, and is a training center for academic personnel under the National Fund for University Education of Colombia. Several medical schools in other countries of Latin America have evidenced interest in using the University of Valle program as a model in the reorganization

of their own systems, and have sent missions to Cali to study the program.

From the beginning, the Faculty of Medicine has emphasized the importance of combining practical experience in the laboratories and clinics with academic studies in the medical sciences. One of the outstanding features of the eight-year course is a final year during which the students serve as residents at a rural medical center in the Cauca Valley in one of four clinical fields or in preventive medicine.

An increasing number of faculty members—many of them trained abroad on fellowships provided by Colombian agencies, the Kellogg Foundation, and The Rockefeller Foundation—have been placed on a full-time basis. Effective research programs on such subjects as nutrition, cardiovascular and pulmonary physiology, and atherosclerosis, have been initiated. During the next few years the Faculty of Medicine expects to give all staff full-time status, and to expand research facilities. A major part of a 1957 grant of \$210,000 from The Rockefeller Foundation will be used for these purposes during the period ending June 30, 1962.

A new library building, conveniently located between the basic sciences building and the hospital which houses the clinical departments, is now under construction. In addition to providing suitable reading and stack space, the building will afford accommodations for some of the students and for visiting professors, and cafeteria facilities for the entire student body and faculty. A portion of the current grant will be used to increase the library's resources of reference books and periodicals.

#### TULANE UNIVERSITY OF LOUISIANA

#### SCHOOL OF MEDICINE

Although pathology continues to be the major tool for describing diseases in terms of tissue change, and thus con-

stitutes the bridge between the pure basic sciences and the clinical fields, research and training in pathology have come to be oriented almost exclusively toward the preparation of clinical pathologists needed in medical practice. At the same time, however, the need has grown for pathologists able to interpret tissue changes in terms of physiological and biochemical changes.

To meet the demand for greater numbers of pathologists for academic positions, and for more clinical pathologists trained to apply the principles and methods of biochemistry to their work in pathology, the Medical School of Tulane University of Louisiana, New Orleans, will establish a new graduate training program in biochemical pathology. The new undertaking will be carried out as a joint responsibility of the Departments of Pathology and of Biochemistry, which two years ago initiated an experimental project to test the feasibility of the formal training course. Students in the program will be prepared not only to serve the medical profession as clinical pathologists but will also be equipped with the biochemical knowledge increasingly demanded for pathological studies. Graduates of medicine trained under the integrated program at Tulane will be able to carry on productive research in either field.

To help defray the expenses of the program during an initial five-year period, The Rockefeller Foundation appropriated \$200,000 to Tulane University of Louisiana.

#### TULANE UNIVERSITY OF LOUISIANA

#### SCHOOL OF MEDICINE

Because of differences between the patterns of secondary and college education in many foreign countries and those in the United States, the problem of adjusting to graduate work in the medical sciences in this country is especially acute for foreign students. The language difficulty

is often severe, and to it is frequently added a complication in the background in the basic sciences, subjects often taught in the country of origin with an emphasis which differs from that in the United States.

For two years Dr. William B. Wendel, professor of biochemistry at the Tulane University School of Medicine, has studied this problem and evolved a plan for a one-year intensive course beginning with English and advanced mathematics and principles of chemistry and physics in the summer extending to some extent into the fall, and with emphasis in the final months on basic courses in biochemistry and an introduction to a research problem. The Graduate School and the School of Medicine will cooperate in offering the courses, which will be at the undergraduate or graduate level as needed. It is hoped that after the special course the students can enter graduate work with full standing and complete their study within a reasonable time.

To help Tulane University inaugurate the specialized courses in English and the basic sciences for foreign students in the School of Medicine, The Rockefeller Foundation has appropriated \$182,000 for use during an initial five-year period.

#### UNIVERSITY OF EL SALVADOR

#### SCHOOL OF MEDICINE

The School of Medicine at the University of El Salvador, which draws approximately one-third of its students from other Central American countries, influences medical training and practice throughout the region. Recently this important center has been strengthening its research and teaching programs at an exceptionally rapid pace.

Within the last two years the medical faculty has established additional full-time teaching posts in the basic sciences, increased the time spent by students in laboratory training

to two-thirds of the total, and limited the number of students admitted to 40 a year. It has also invited four professors to come to the school from other countries to participate in further development and strengthening of the basic science departments. The visitors, including specialists in biochemistry, pathology, microbiology, and pharmacology, have joined the faculty on four-year contracts.

Another development at the school has been the organization of a program in preventive medicine integrated into the general curriculum from the first year on. Under the new program students will study epidemiology, biostatistics, and other fundamental public health sciences in their early years, and later, in the clinical years, will gain public health experience in a new health center and outpatient facility adjoining the medical school and the teaching hospital. After internship, they will devote an additional year to rural and community health practice under the auspices of the medical faculty and the Salvadorian government.

The financial means for these projects have been provided by the Government of El Salvador, the International Cooperation Administration of the United States government, the Kellogg Foundation, and private sources. Additional support was given by The Rockefeller Foundation in 1957, through a two-year grant of \$171,000 to the university.

CAMPAIGN FOR THE IMPROVEMENT  
OF HIGHER EDUCATION PERSONNEL

MEDICAL AND NURSING FELLOWSHIPS

In recent years the demand for medical and nursing instructors in Brazil has reached unprecedented proportions. Between 1950 and 1955 ten new medical schools were established; two more were organized in 1956 and 1957, and plans have been made to open two or three additional

medical schools in 1958. Of the 35 nursing schools in the country, 13 have been established since 1950, and all but five are understaffed. Until a graduate school of nursing can be organized, the regular nursing schools must also serve as centers for teacher training.

The Campaign for the Improvement of Higher Education Personnel (CAPES), Rio de Janeiro, has been concerned with increasing the numbers of well-trained medical educators in Brazil since its establishment in 1953 by the Brazilian government. With the help of a Rockefeller Foundation grant, CAPES awarded 54 fellowships in the medical sciences between 1955 and 1957 which gave one year of study in Brazil to teachers in medical faculties assured of positions after their training. The greatest emphasis has been placed on the training of instructors in basic science departments, but fellowships are also awarded in clinical medicine, pediatrics, and general surgery. The former fellows now returned to their posts have already demonstrated their enhanced proficiency as teachers, and their concern with a constantly improving standard of instruction is arousing interest in other departments.

A new grant of \$145,000 will continue Foundation support of the CAPES fellowship program in the medical sciences, and aid in the initiation of a similar program in nursing. The funds will make possible the award of approximately 25 medical and 10 nursing fellowships in 1958 and 1959.

**EDUCATIONAL COUNCIL FOR FOREIGN  
MEDICAL GRADUATES**

**EVALUATION SERVICE ABROAD**

In recent years increasing numbers of foreign medical school graduates are coming to the United States for advanced training. A 1955 survey of 1,329 American hospitals

disclosed that at least 6,000 alien physicians were employed as house officers; an additional 1,000 foreign-trained physicians were serving as interns or residents on immigrant visas. Present estimates are that some 3,500 foreign medical graduates enter the country each year, and the number seems to be steadily rising.

The great demand for larger numbers of house officers in American hospitals has led the Educational Council for Foreign Medical Graduates, Chicago, Illinois, to design a program to assist them in selecting foreign medical school graduates for internship and residency appointments. In 125 cities abroad the council will undertake to verify the credentials of each candidate, ascertain whether the candidate has acquired sufficient knowledge of the English language to profit by his experience in an American hospital, and determine whether the candidate's background in the basic and clinical medical sciences is such that he will be able to adjust easily to American medical practice. Candidates will then be certified to the hospitals or organizations which they request.

The Educational Council's program, which has the sponsorship of the American Medical Association, the American Hospital Association, the Association of American Medical Colleges, and the Federation of State Medical Boards of the United States, will be partially financed by a two-year grant of \$100,000 from The Rockefeller Foundation.

#### UNIVERSITY OF PUERTO RICO

#### SCHOOL OF MEDICINE

A Foundation-aided survey of medical facilities in the Bayamón region of Puerto Rico focused attention on the plans of five different agencies to build medical institutions in various parts of the San Juan metropolitan area. The

Ruiz Soler Tuberculosis Hospital was to be converted into a general district hospital; the two municipal hospitals of San Juan were to be consolidated; new cancer and workmen's compensation hospitals were to be constructed; and a new medical sciences building for the University of Puerto Rico was contemplated.

The survey group suggested that all five buildings be grouped on one plot where their operations could be co-ordinated to provide Puerto Rico with its first major medical center. The idea was approved by the Commonwealth Planning Board and subsequently by the Legislature, which allocated funds for over-all planning.

Detailed planning for the medical school at the new site remains to be done. Toward the costs of a comprehensive study and report on the functioning of the relocated school, and on the teaching and research facilities requisite for it in the other units of the center, the Foundation has made a one-year grant of \$75,000 to the University of Puerto Rico.

#### NATIONAL RESEARCH COUNCIL

##### FELLOWSHIPS IN THE MEDICAL SCIENCES

The Rockefeller Foundation has appropriated \$50,000 to the National Research Council, Washington, D.C., for fellowships in the medical sciences. The Foundation and the General Education Board have made similar grants, now totaling almost \$1,800,000, continuously since 1922.

The new funds will enable the council to continue its fellowship program through an interim period while a study is completed to determine whether the national program is in balance and to delineate present-day areas of need. With the balance of another appropriation of \$150,000 made in April, 1954, the grant will be available for use through June, 1959.

**BRAZILIAN NURSING ASSOCIATION****SURVEY OF NURSING RESOURCES**

The Brazilian Nursing Association, Rio de Janeiro, was formed some years ago by a group of leaders in the profession to promote good nursing service and education for Brazil. The association elected to help plan future training programs for staff nurses and nurse auxiliaries, and to do this effectively it has been making a complete survey of the country's present nursing resources.

The work is being guided by an advisory committee under the chairmanship of Miss Maria Rosa S. Pinheiro, president of the association, director of the School of Nursing at the University of São Paulo, and a former Rockefeller Foundation Fellow. Basic information was gathered in the course of a preliminary study by Miss Haydée Guanaes Dourado, full-time director of the survey, who studied survey methods in the United States. The Pan American Sanitary Bureau has assigned a member of its staff, Miss Maria Palmira Tito de Moraes, also a former Foundation Fellow, to help the association with the survey.

The Rockefeller Foundation appropriated 2,638,000 cruzeiros (about \$45,000) to be available for one year together with funds remaining from a previous grant in aid which supported the preliminary study.

**UNIVERSITY OF GUADALAJARA****FACULTY OF MEDICINE**

The Faculty of Medicine of the University of Guadalajara, Mexico, has been developing a dynamic teaching program by emphasizing sound practical work along with theoretical instruction. Full-time posts in the basic sciences have been created, and provision has been made for laboratory teaching and research by both staff and students. By

encouraging students to undertake research projects during their years of study, the faculty is also helping to train a nucleus of young men who may well become future professors in the sciences.

To help the faculty develop further its program in the basic sciences, The Rockefeller Foundation has made a one-year grant of \$40,000 for research equipment needed in the Departments of Physiology, Biochemistry, and Pathology. The appropriation is in line with the Foundation's current program in medical education in Mexico which seeks to support promising provincial medical faculties in developing full-time teaching and research, particularly in the basic sciences.

#### UNIVERSITY OF CHIHUAHUA

##### SCHOOL OF MEDICINE

In 1954 the University of Chihuahua began to develop a small but modern medical school to train doctors for the north Mexican region. The school was opened in January, 1955, in temporary quarters in the Central Hospital and in September of the same year moved to its own new basic sciences building. In its first year the school accepted 15 students, and has now limited the enrollment to 25 new students yearly.

Dr. J. Remolina, a former Foundation Fellow and the first of a projected cadre of full-time professors at the Chihuahua Medical School, has developed in the Department of Physiology, of which he is head, a teaching and research laboratory which will eventually serve other basic science departments. To furnish it with equipment needed for the full development of its teaching and research program, The Rockefeller Foundation in 1957 appropriated \$20,000.

**UNIVERSITY OF ISTANBUL****INSTITUTE OF PHYSIOLOGY**

Under the leadership of Dr. Hans Winterstein and the immediate direction of Dr. Meliha Terzioglu, full-time professor of physiology, the Institute of Physiology of the University of Istanbul Faculty of Medicine has carried on productive research and training programs. Despite the limited amount of time available for large numbers of students, Dr. Terzioglu has ensured their receiving extensive experience at the laboratory level in physiology. Dr. Terzioglu consistently publishes articles in international journals on such subjects as metabolism, hematology, and, more recently, high altitude physiology.

To provide the Istanbul Faculty of Medicine, the oldest in Turkey, with funds needed for equipment and supplies for the Institute of Physiology, The Rockefeller Foundation in 1957 appropriated \$20,000.

**OTHER GRANTS**

Medical Library Association, Inc., New Haven, Connecticut: fellowships in medical librarianship; \$15,000 for a three-year period;

New York University—Bellevue Medical Center, New York: Institute of Physical Medicine and Rehabilitation; to train a group of Burmese in the techniques of rehabilitation; \$11,000;

University of California, Los Angeles:

To provide the School of Nursing with an associate research sociologist to assist in the development of a doctoral program in nursing; \$10,000;

Dr. Raymond B. Allen, chancellor, and Mrs. Allen; to attend the Council of the World Medical Association in Istanbul, Turkey, and to visit universities in Europe and the Soviet Union; \$5,350;

**University of Michigan, Ann Arbor:**

A faculty exchange program between the Medical School and the Faculty of Medicine of the University of Antioquia, Medellín, Colombia; \$10,000;

Dr. H. Marvin Pollard, professor of internal medicine, Medical School; to visit Latin American centers of internal medicine and gastroenterology; \$1,625;

**University of Wisconsin, Madison:** to continue a curriculum study of the Medical School; \$10,000;

**University of Valle, Faculty of Medicine, Cali, Colombia:**

Dr. Howard J. Tatum, associate professor of obstetrics and gynecology, School of Medicine, Louisiana State University, New Orleans; to serve as visiting professor in the Departments of Obstetrics and Physiological Sciences; \$9,200;

To appoint Dr. Antonio Colas Espada, formerly of the University of Salamanca, Spain, as professor of biochemistry in the Department of Physiological Sciences; \$5,000;

Dr. Alfonso Ocampo L., professor of surgery and director, Departmental University Hospital, and Mrs. Ocampo; to observe recent developments in the field of surgery and in medical regionalization programs in the United States and Puerto Rico; \$3,050;

Dr. Luis M. Borrero, head, Department of Physiological Sciences; to take a summer course in physiology at Baylor University School of Medicine, Houston, Texas, and to observe the teaching of neurophysiology in the United States; \$2,050;

**American Nurses' Foundation, Inc., New York:**

To provide field services to nurses from abroad who come to the United States under the Exchange Visitor Program; \$9,000;

To enable a skilled consultant to visit refugee Hungarian nurses in various parts of the United States to assist them in obtaining their licenses to practice and to help them in obtaining employment in nursing; \$2,500;

**Fluminense Faculty of Medicine, Niterói, Brazil:** equipment and supplies for the Department of Parasitology; \$9,000;

**Harvard University, Cambridge, Massachusetts:**

Dr. Herrman L. Blumgart, professor of medicine, Medical School, and physician-in-chief, Beth Israel Hospital, Boston, and Mrs. Blumgart; to visit medical centers in India and to participate in the internship-residency program of King George's Medical College, University of Lucknow; \$7,150;

Dr. Edward D. Churchill, John Homans Professor of Surgery, Medical School, and chief, General Surgical Services, Massachusetts General Hospital, Boston, and Mrs. Churchill; to visit medical centers in India and to participate in the internship-residency program of King George's Medical College, University of Lucknow; \$6,600;

Equipment for use in the Biophysical Laboratory by Dr. Guillermo Whittembury, assistant, Department of Internal Medicine, University of San Marcos, Lima, Peru; \$1,000;

Christian Medical College, Ludhiana, India: teaching and investigation in the Department of Preventive Medicine, with emphasis on the application of health education techniques to the problem of environmental sanitation; 28,600 rupees (about \$6,235);

University of Paraíba, João Pessoa, Brazil: supplies and equipment for the Department of Histology and Embryology, Faculty of Medicine; \$6,000;

Dr. John Benjamin Wyon, field director, India-Harvard-Ludhiana Population Study, Khanna, India, and Mrs. Wyon: to observe advances in the field of population dynamics in the United States; \$5,900;

University of Pittsburgh, Graduate School of Public Health, Pennsylvania:

Dr. John R. McGibony, professor of medical and hospital administration, and Mrs. McGibony; to serve as consultant in hospital administration to the Government of India, and to observe developments in hospital administration in Europe, India, and Burma; \$5,750;

Dr. Theodore Frederick Hatch, professor of industrial health engineering; to visit centers of occupational health research and industrial hygiene in Europe; \$1,025;

American University of Beirut, Lebanon: to assist the School of Public Health in obtaining the services of two visiting professors; \$5,300;

Tokyo University, Faculty of Medicine, Japan:

Dr. Hiroshi Kumagai, professor of pharmacology; to observe developments in medical education and pharmacology in the United States; \$4,625;

Dr. Tadashi Miyakawa, professor of radiology; to visit medical colleges in the United States to observe teaching methods and research in radiology; \$4,300;

Dr. Takashi Kobayashi, professor of obstetrics and gynecology; to visit medical colleges in the United States and Canada to observe teaching methods and research in gynecological endocrinology; \$3,900;

Dr. Takeo Hayashida, professor of surgery, Division of Health Care and Nursing; to visit university schools of nursing in the United States; \$3,800;

Dr. Tadao Takatsu, professor of pediatrics; to observe developments in medical education and pediatrics in the United States; \$3,800;

Dr. Takeo Kuroyanagi, instructor, and professor, School of Nursing; to visit schools of nursing in the United States to observe developments in nursing education; \$525;

Dr. Hannah Mabel Sharma, assistant director of public health, Government of Madras Province, Madras, India: to observe modern trends in organization and administration of maternal and child health in the United States, Puerto Rico, the United Kingdom, and Scandinavia; \$4,600;

Dr. Jorge Vergara Delgado, Bogotá, Colombia: to observe the development of child health and welfare programs in the United States; \$4,500;

Christian Medical College, Vellore, India:

Dr. Kaithayil George Koshi, associate professor and head, Department of Preventive and Social Medicine; to observe recent developments in medical education with special attention to preventive

medicine and related research activities in the Philippines, the National Republic of China, Japan, the United States, Puerto Rico, and the United Kingdom; \$4,450;

Continued development of a hospital record system; 14,500 rupees (about \$3,160);

Dr. John Kingdon Guy Webb, professor of pediatrics; to observe recent developments in medical education and virus research in the United States; \$3,025;

**University of Ceylon:**

*At Colombo:*

Dr. Osmond Edwin Randolph Abhayaratne, dean, Faculty of Medicine; to observe undergraduate and postgraduate medical education and particularly the teaching of preventive medicine at medical schools in the United States, Canada, and Puerto Rico; \$4,300;

*At Peradeniya:*

Sir Nicholas Attygalle, vice-chancellor; to observe university education and particularly medical education at universities in the United States, Canada, and Puerto Rico; \$4,300;

**Keio University, School of Medicine, Tokyo, Japan:**

Dr. Torai Iwahara, professor of orthopedic surgery; to observe recent developments in medical education and new techniques employed in bone surgery at centers in the United States; \$3,925;

Dr. Tadayoshi Kobayashi, professor of pathology; to observe recent developments in the teaching of pathology at medical schools in the United States; \$3,850;

Dr. Akira Inamoto, professor of anesthesiology, School of Medicine, Kyoto University, Japan; to observe the latest methods of anesthesia and the teaching of anesthesiology in the United States; \$3,875;

Dr. Amy D. Engineer, professor and head, Department of Obstetrics and Gynecology, King George's Medical College, University of Lucknow, India; to observe specified aspects of obstetrical and gynecological programs in the United States; \$3,800;

Dr. V. Enrique Fernandez E., assistant professor of physiology, Faculty of Medicine, University of San Marcos, Lima, Peru: to visit departments of physiology in the United States; \$3,750;

University of Ankara, School of Medicine, Turkey:

Dr. Zeki Faik Ural, professor of preventive medicine; to visit departments of preventive medicine in the United States, Puerto Rico, and Colombia; \$3,600;

Dr. Sevim Bike Ornek, research assistant, Institute of Hygiene; to return to Ankara after study in the United States; \$685;

Dr. Ivan L. Bennett, Jr., associate professor of medicine, the Johns Hopkins University, and head, Biological Division, the Johns Hopkins Hospital, Baltimore, Maryland: to consult and lecture in India on the use of antibiotics; \$3,475;

Dr. Fryderyk Pautsch, professor of biology and dean, Medical Faculty, Medical Academy, Gdansk, Poland: to study new methods in crustacean endocrinology and in medical education in the United Kingdom and Scandinavia; \$3,425;

Jan Richard Sievers, medical candidate, Cardiological Laboratory, Department of Medicine, University of Lund, Sweden: to study biostatistics with reference to chronic disease problems at the Johns Hopkins University, Baltimore, Maryland; \$3,400;

Dr. Leonard Bruce-Chwatt, Malaria Service, Medical Department, Lagos, Nigeria: to participate in a survey group to evaluate the National Malaria Control Program of India; \$3,350;

Dr. Krishna Murari Lal, director, Medical and Health Services, Government of Uttar Pradesh, Lucknow, India: to observe national health insurance and public health and rehabilitation programs in the United Kingdom, Scandinavia, on the Continent, and Japan; \$3,300;

Dr. Leon Tochowicz, rector, Medical Academy, and professor of medicine, University of Cracow, Poland: to observe recent developments in the organization of medical education in Scandinavia, England, and the United States; \$3,025;

Dr. Dymitr Aleksandrow, head, Second Medical Clinic, Medical Academy, Warsaw, Poland: to observe developments in atherosclerosis

and cardiology and in medical education and research at institutions in the United States; \$3,000;

Dr. Bogusław Bobranski, rector, Medical Academy, Wrocław, Poland: to observe developments in the field of pharmacology and in medical education and research at institutions in the United States and Europe; \$3,000;

University of London, England:

Dr. Alexander Duff Robertson, lecturer in social and preventive medicine, London School of Hygiene and Tropical Medicine and Royal Free Hospital School of Medicine; to visit centers of preventive medicine in the United States and Jamaica; \$3,000;

Dr. John Eric Roberts, Joel Professor of Physics Applied to Medicine and director, Barnato Joel Laboratories, Middlesex Hospital; to attend a seminar on thyroid uptake intercalibration at the Oak Ridge Institute of Nuclear Studies, Tennessee, and to visit centers of medical physics in the United States; \$1,425;

University of São Paulo:

*At Ribeirão Preto:*

Dr. Miguel Rolando Covian, professor of physiology, Faculty of Medicine; to visit departments and research centers of physiology in the United States; \$3,000;

Miss Glete de Alcantara, director, School of Nursing; to visit centers of nursing education in the United States; \$2,400;

*At São Paulo:*

Dr. Euryclides de Jesus Zerbini, assistant professor of thoracic surgery, Faculty of Medicine; to visit centers of thoracic surgery in the United States; \$2,800;

Dr. Luiz Carlos Uchoa Junqueira, professor of histology, Faculty of Medicine; to visit medical centers in Europe; \$1,850;

Dr. Velimir B. Vouk, acting director, Institute of Industrial Hygiene, Yugoslav Academy of Sciences and Arts, Zagreb: to visit medical schools and research institutions in the United States to observe

methods of research and training in industrial medicine and industrial hygiene; \$2,800;

Dr. José Rodrigues da Silveira, III, director, Faculty of Medicine and Surgery of Pará, Belém, Brazil: to visit medical schools in South America, Puerto Rico, and the United States; \$2,750;

University of Antioquia, Faculty of Medicine, Medellín, Colombia:

Dr. Emilio Bojanini, associate professor of pathology; to visit pathology centers in the United States; \$2,650;

Dr. Pablo Perez Upegui, professor of psychiatry and medical psychology; to observe teaching methods in psychiatry and medical psychology in the United States; \$2,650;

Dr. Hernando Velez, assistant professor of surgery; to observe the teaching of surgery in the United States; \$2,600;

Dr. Paulo de Goes, professor of microbiology and director, Institute of Microbiology, University of Brazil, Rio de Janeiro: to visit centers of research and teaching in microbiology in the United States and Canada; \$2,600;

Miss Margaret Jean Callbeck, chief psychiatric research nurse, Department of Public Health, Province of Saskatchewan, Saskatoon, Canada: to observe psychiatric research techniques in the United States; \$2,550;

Dr. C. S. Ronsse, director, University Hospital, Lovanium University, Leopoldville, Belgian Congo: to observe the general organization and planning of university hospitals in the United States; \$2,500;

Miss Helen Kathleen Mussallem, Canadian Nurses' Association, Ottawa: to observe the accrediting program of the Education Division of the National League for Nursing, Inc., New York; \$2,300;

Dr. John David Spillane, lecturer in neurology, Welsh National School of Medicine, Cardiff: to visit the University College of the West Indies, Mona, Jamaica; \$2,100;

Dr. Robert Ely Shank, professor and head, Department of Preventive Medicine, Washington University, St. Louis, Missouri: to consult with the Faculty of Medicine of Ribeirão Preto, University of São

Paulo, Brazil, on the development of programs for comprehensive medical care and teaching, and to observe medical education and nutrition research activities in Latin America; \$2,000;

Dr. George Gordon Reader, associate professor of medicine, Cornell University Medical College, New York: to consult with the Faculty of Medicine of Ribeirão Preto, University of São Paulo, Brazil, on the development of programs for comprehensive medical care and teaching, and to observe medical education and research activities in Latin America; \$1,950;

Dr. Eduardo Jorge Wanderley, Jr., professor of surgery, Faculty of Medicine, University of Recife, Brazil: to visit medical centers in the United States and Canada; \$1,946;

University of Chile, Faculty of Medicine, Santiago:

Dr. Joaquín Harnecker, extraordinary professor of medicine; to observe the teaching of clinical medicine and the work being done on the collagenic diseases in the United States, Canada, and Mexico; \$1,950;

Dr. Benjamin Viel, professor of epidemiology and preventive medicine and director, School of Medicine; to observe the teaching of preventive medicine and the organization of departments of preventive medicine in the United States; \$1,600;

Dr. Onofre Avendano, extraordinary professor of obstetrics; to observe the teaching of obstetrics and the integration of obstetrics in departments of preventive medicine in the United States; \$1,250;

Dr. German Ducach Grinberg, first assistant, Chair of Medicine "F," and chief, Department of Hematology, San Juan de Dios Hospital; to observe recent developments in the field of hematology and in the teaching of internal medicine in the United States; \$1,000;

Dr. Kaneyoshi Akazaki, professor of pathology, School of Medicine, Tohoku University, Sendai, Japan: to observe recent developments in the teaching of pathology in the United States; \$1,925;

University College of the West Indies, University Hospital, Mona, Jamaica:

Dr. Victor James Keating, senior anesthetist and associate lecturer in anesthesia; to visit departments of anesthesiology in the United States; \$1,800;

Dr. David Maurice Picou, medical casualty officer; to accept an appointment as resident physician at the Children's Hospital of Philadelphia, Pennsylvania; \$425;

Miss Elizabeth Norrie Hughes, principal tutor, Footscray Hospital, Melbourne, Australia: to observe methods of nursing education in hospitals and schools of nursing in the United States and Canada; \$1,750;

Dr. Otto Guilherme Bier, professor of microbiology, Paulista School of Medicine, São Paulo, Brazil: to visit centers of research and teaching in microbiology in the United States and Canada; \$1,655;

Dr. Katharine O'Shea Elsom, assistant professor of public health and preventive medicine, School of Medicine, University of Pennsylvania, Philadelphia: to visit medical care centers in the United States; \$1,500;

Dr. Seri Condar Nainggolan, director, Tuberculosis Control and Department of Medicine, Ministry of Health, Djakarta, Indonesia: to visit centers of tuberculosis control in the United States; \$1,500;

Miss Ruth E. McClure, assistant professor of nursing, University of Alberta, Edmonton, Canada: to visit university schools of nursing in the United States and Canada; \$1,425;

Dr. John Russell Ritchie, senior lecturer in anesthetics, University of Otago, Dunedin, New Zealand: to observe developments in medical education, with particular reference to anesthesiology, in the United States and Canada; \$1,200;

Dr. Tadashi Maekawa, lecturer in internal medicine, Gunma University, Maebashi, Japan: to visit hematological centers in the United States; \$1,100;

Dr. Tongchai Papasarathorn, instructor in parasitology, School of Public Health, Bangkok, Thailand: to visit departments of parasitology in the United States, Lebanon, and India; \$1,050;

**University of El Salvador, School of Medicine, San Salvador:**

Dr. Juan José Fernandez, Jr., professor of medicine and associate professor of clinical therapeutics; to observe the organization and teaching methods of medical schools in the United States; \$1,050;

Dr. Juan Allwood Paredes, professor of hygiene and public health; to observe the organization of the Schools of Medicine of the University of Valle, Cali, Colombia, and the University of Puerto Rico, San Juan; \$950;

Dr. Luis Edmundo Vasquez, professor of clinical medicine; to observe the organization of the Schools of Medicine of the University of Valle, Cali, Colombia, and the University of Puerto Rico, San Juan; \$950;

Dr. Fabio Castillo, professor of physiology; to observe the organization of the School of Medicine of the University of Valle, Cali, Colombia; \$700;

Dr. Joaquín V. Luco, professor of neurophysiology, School of Medicine, Catholic University of Chile, Santiago: to visit medical schools in Brazil to observe the organization of preclinical laboratories and courses; \$1,000;

**All-India Institute of Medical Sciences, New Delhi:**

Dr. Eric Joseph Lazaro, associate professor of surgery; to observe developments in medical education at medical centers in the United States; \$1,000;

Dr. Liza Wallapurakal Chacko, professor and head, Department of Anatomy; to visit departments of anatomy in the United States; \$700;

Dr. Bo Vahlquist, dean, Faculty of Medicine, University of Uppsala, Sweden, and head, Department of Pediatrics, University Hospital: to visit representative medical colleges in the United States to observe recent developments in medical education; \$950;

Sir Stanley Davidson, professor of medicine, University of Edinburgh, Scotland, and Lady Davidson: to visit the Faculty of Medicine, University College of the West Indies, Mona, Jamaica; \$925;

Dr. Don Lionel Joannes Kahawita, director, Health Services of Ceylon, Colombo: to observe developments in medical and health administration in the United States, Puerto Rico, and India; \$750.

## Medical Care

### GOVERNMENT OF PUERTO RICO

#### DEPARTMENT OF HEALTH

Because Puerto Rico is becoming increasingly a place for study by students from other countries, particularly in Latin America, its current program for reorganization of its medical and public health facilities on a regional basis has international as well as national importance. Part of the funds needed for the program will be provided by Rockefeller Foundation grants of \$25,000 and of \$565,000, the combined sums to be available to the Department of Health of Puerto Rico through the period ending June 30, 1962. The current appropriations bring the total of Foundation support of the project to over \$800,000.

One of the chief aims of "regionalization" is improvement of the distribution of medical services on the island. A survey in a recent year showed that although Puerto Rico had a ratio of one physician for 2,000 residents, many municipalities with large populations had less than one physician for 4,500 residents. It also demonstrated that although medical service of good standard was not accessible to all residents of the island, adequate physical facilities were available for this purpose.

The regional system depends on the consistent decentralization of health services to a district and municipal level. It provides for the care of patients in multipurpose local health offices and their referral if necessary to more advanced medical centers where staff and equipment are

concentrated for the diagnosis and treatment of complicated diseases. The screening of patients for specialized medical attention is designed to conserve this type of care for those who need it most.

The program is being introduced first in the Bayamón district of Puerto Rico, where about 30 per cent of the island's population live. Responsibility for its progress has been assigned to a Regionalization Office under the direction of Dr. Reinaldo Ferrer, former Deputy Secretary of Health for the island.

The group under Dr. Ferrer has already assumed control of the Bayamón District Hospital and of the multi-purpose health center at Comerío, where they are formulating new procedures for the recording of referrals to district centers and of contacts by public health personnel with the individual and the family in the local community. In addition a system for the continuing education of health center personnel has been formulated and put into operation whereby senior personnel from the District Hospital visit the outlying health centers for consultation and for training of staff, and personnel in the smaller offices go to the central institution periodically for in-training and orientation.

New techniques for regional organization will be introduced gradually at all installations in the Bayamón district as they are worked out by the Regionalization Office. Once total regionalization of the Bayamón district has been accomplished, in about five years, the other areas of Puerto Rico should be able to reorganize their health services much more rapidly.

The nodal point of the regional network in the Bayamón section will be a large medical center in Río Piedras consolidating four hospitals and a new medical sciences building for the University of Puerto Rico. The Commonwealth Planning Board and the Legislature have approved construction of the center, now in the final planning stages.

In cooperation with the Department of Preventive Medicine of the University of Puerto Rico Medical School and The Rockefeller Foundation, the Government of Puerto Rico three years ago undertook a survey of Puerto Rican health and welfare facilities and a study of techniques to improve their utilization. As a result of this investigation the present program was devised for the regional organization of health and welfare services.

#### AMERICAN PUBLIC HEALTH ASSOCIATION, INC.

Since its establishment in 1872 the American Public Health Association, Inc., New York, has exercised leadership in setting standards for public health services and in initiating voluntary and official action in the health fields. Today, largely because of the activities of such groups as the association, many former public health needs have been met. At the same time, a whole new group of problems has arisen as a result of the changing structure of the population, the rapid but fragmented growth of prepaid medical care services, and industrial and technological advances—particularly the use of atomic energy.

To deal more vigorously with present-day challenges in public health, the association plans to reorganize its structure, establishing several new standing committees and adding to its staff ten members experienced in such matters as accident prevention, environmental hazards, and medical care services. Among the subjects which the association plans to emphasize during the next few years are the recruitment, training, and placement of personnel, mental health, and chronic disease and medical care programs. It will also expand and improve its services to sections and branch associations, stimulate relevant research, and extend the program through which it formulates standards in the fields of its concern.

To aid the American Public Health Association in developing the expanded program of services to professional workers in the field of public health, The Rockefeller Foundation has made a three-year grant of \$150,000.

#### UNIVERSITY OF TORONTO

##### SURVEY OF GENERAL MEDICAL PRACTICE

In an attempt to determine the type of family physician needed in Canada, and the factors which govern the quality of medical practice, the University of Toronto has initiated a study of general medical practice similar to one recently completed by the University of North Carolina with Rockefeller Foundation support. The study employs many of the techniques—such as personal interviews, direct observation of the work of the physicians participating, and statistical methods—developed in the North Carolina study.

Unlike the earlier study, however, the University of Toronto survey will be conducted on a Dominion-wide basis because of the very great variations in population density, economic prosperity, medical practice habits, and methods of payment for medical care in different parts of Canada. The Toronto phase of the project, already begun, has been divided into stages, the first of which, limited to the Province of Ontario, is already well advanced.

The Canadian survey will include an examination of the type and volume of illness treated by general medical practitioners under the varying circumstances obtaining in different parts of Canada. Attention will also be given to the effects that the diverse economic and geographic characteristics of various regions of Canada may have on general medical practice, and to the doctors' relations with professional organizations, their families, and their communities as these may affect their practice.

The survey has the backing of the Canadian Medical

Association and the Canadian College of General Practice, and the financial support of the Canadian Department of Public Health and the Canadian Life Insurance Officers' Association. A Rockefeller Foundation grant of C\$110,000 (about \$115,500) to the University of Toronto will supplement other funds made available for the study during the period ending December 31, 1960.

## Field Service

Rockefeller Foundation field services for medical education and public health, carried on through offices in Santiago, Chile, New Delhi, India, and Rio de Janeiro, Brazil, were augmented early in 1957 by the arrival in Baghdad, Iraq, of a Foundation staff member. It was expected that he would serve primarily as consultant in medical education and public health matters to the Government of Iraq.

The general policy of the Foundation in medical education outside the United States is to concentrate in a given country or region on aiding the development of a few institutions which show particular promise in training teachers and research workers for the faculties of these and other schools in the country or region. The development of such institutions is already well advanced in India, Brazil, Chile, Colombia, Mexico, and Japan, and the program will shortly be extended to other areas. This pattern of attack, it is believed, will result not only in assisting selected schools to become examples, but will also facilitate the more rapid development of the intellectual resources of the various countries within their own cultural traditions. Maximum use of the advanced training centers thus established can probably be achieved by encouraging local and national study fellowships—in contrast to those for foreign study—for younger teachers and research workers.

In the United States the emphasis is more on the support of studies and exploratory efforts in the improvement of the quality of medical education in a few institutions where special attention is being given to problems arising from social and technological change. An example is the encouragement of university-wide programs, including medicine and public health, based on the implications of the expanding applications of atomic energy.

Two staff members in medical education and public health are on special assignment, one to the World Health Organization as consultant on malaria control, the other to the School of Medicine of the University of Puerto Rico for cooperation with an experiment in the regionalization of medical and health facilities in the Bayamón area. A Foundation grant toward the regionalization experiment is described elsewhere in the Annual Report. A third staff member has been working on a project for the improvement of insecticide spraying equipment.

For the support of medical education and public health field services during 1958, The Rockefeller Foundation has appropriated \$356,525. Another grant of \$65,000 was made to finance the project for the development of superior insecticide spraying equipment for use in malaria control and in agriculture.

## General

KEIO UNIVERSITY

SCHOOL OF MEDICINE

Although Japan possesses a number of outstandingly competent nuclear physicists and, understandably, great public awareness of the dangers of radiation, few Japanese scientists are trained in radiobiology and in the engineering

development of nuclear devices. In connection with the Japanese Atomic Energy Commission's program for the industrial development of nuclear power, the Japanese government and Japanese universities are attempting to train scientists to deal with related health problems.

Dr. Masakazu Kurata, trained in radiobiology at the Universities of Pittsburgh and Rochester under a Rockefeller Foundation fellowship, will head a new program in radiation toxicology in the Department of Preventive Medicine and Public Health of the Keio University School of Medicine. To provide equipment needed for teaching and for research dealing with the effects of long exposure to low radiation levels and the effects of shielding in biologic responses, The Rockefeller Foundation in 1957 appropriated \$18,000 to Keio University, Tokyo, Japan.

#### OTHER GRANTS

Social Science Research Council, New York: a conference on problems relating to research in the medical and social sciences, to be held under the auspices of the Committee on Preventive Medicine and Social Science Research; \$10,000;

University of Puerto Rico, San Juan: toward the establishment of a radioisotope techniques training center; \$8,000;

University of Pittsburgh, Pennsylvania: development of a program in radiobiology, by the Department of Occupational Health, Graduate School of Public Health; \$7,400;

University of Valle, Departmental University Hospital, Cali, Colombia: to acquire the services of a medical record librarian from the United States; \$5,200;

Fund for grants of amounts not exceeding \$500 for allocation under the supervision of the Foundation's Director for Medical Education and Public Health; \$5,000.



## **Biological and Medical Research**

BIOLOGICAL AND MEDICAL RESEARCH

*Major Interests, 1957*

The Biological Basis of Behavior .....	\$ 395,750
General Biology .....	335,000
Marine Biology .....	1,288,500
Genetics .....	203,425
Biochemistry .....	395,500
Biophysics .....	250,000
Virology, including the Foundation's Virus Research Program .....	1,387,060
Fellowships .....	500,000
Grants in Aid .....	500,000

# BIOLOGICAL AND MEDICAL RESEARCH

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A N IMPORTANT PORTION of the Foundation's support of research in the biological and medical sciences during 1957 was used for the further development of research in marine biology. With a surface area more than twice that of the land masses, with an average depth of nearly 12,500 feet, the oceans and seas of the earth are an unbelievably rich storehouse of plant and animal life. In their waters and deep muds are a vast accumulation of chemicals and organic detritus out of which it is possible to read a few chapters of the history of the earth and of the living organisms that have inhabited it. In the flow and the conflict of their 1,000-mile currents are the roots of much of the world's climate and weather. To the biologist who looks upon ocean waters as a medium out of which have migrated the earliest forms of animal life, the sea and its creatures are a rich reservoir for studies of embryology, of developmental physiology, of behavior, of ecology, and of evolution. In Europe, in the Americas, and in a few countries of the Far East there are distinguished laboratories of marine biology which have been pioneer centers for such studies and for corollary investigations in broader problems of oceanography, marine geology, meteorology, and the development of new food resources. In 1957 the Foundation

continued its aid to projects in marine biology through a series of grants which are described in a later portion of this report.

With the continuing development of ever more precise machines and methods for the separation of cell particles and for the analysis of the organic constituents which characterize them, there has grown in the last decades almost a new science of biology. Often called molecular biology, it covers the newer aspects of quantitative biology and overlaps many of the special fields of biochemistry and biophysics. The older morphological studies of cells and tissues have, with the newer electron microscopes now available, become analyses of cellular ultrastructure. The ultracentrifuge and the modern techniques of gradient separation have enabled scientists to locate more precisely within the cell various centers of enzyme and protein production. The X-ray crystallographer and the chemist are describing with increasing exactitude the shape and function of nucleic acids so that the biologist has moved a few steps nearer an understanding of the mechanisms of inheritance. The modern geneticist is now as much a chemist as a biologist, and today he can locate on chromosomes many special loci which are concerned with the organism's response to particular components of its environment. Where yesterday the microscopist could not probe deeply into the minute anatomy of some of the smaller bacteria, today he can describe many architectural details of the infinitely more tiny virus particles.

In 1957 a substantial portion of the Foundation's support of biological and medical research was again devoted to aid for projects in molecular biology, biochemistry, and biophysics. As was pointed out in last year's report, much of this work is coming to have an increasingly obvious bearing on the Foundation's long-standing study of viruses and the diseases which they cause. This interest in virology continues to expand, as evidenced by the somewhat larger sum

appropriated for work in the Foundation's own laboratories and by two grants to other organizations conducting similar studies.

A very large proportion of the grants made during the past year were in support of work being pursued in foreign countries. Most of the recipient institutions were in Europe or Latin America but the beginnings of an expanding program for India and Japan may be detected in the list of fellowships and small grants in aid for research. These overseas grants serve two general sorts of purpose. Frequently, and especially in Europe, they enable well established investigators of outstanding stature to do more and better work than they otherwise could. It remains an unfortunate fact that financial stringency in many countries with proud traditions of scholarship makes it impossible to provide appropriate facilities for even the most eminent scholars, especially if such facilities require the use of foreign exchange. The Foundation's grants in such circumstances frequently result in contributions to the "world pool of knowledge" quite out of proportion to that which could be expected from the expenditure of the same sum of money in the United States.

The other objective of the Foundation's overseas grants is the encouragement of scientific work in areas which are in one or another stage of the "revolution of rising expectations." Local governments and the outside authorities responsible for much of the technical assistance must necessarily be preoccupied with meeting immediate needs for economic development. More often than not, this may be done by direct transfer of techniques developed elsewhere for the establishment of manufacturing, increasing agricultural production, or the improvement of health. In the long run, however, such immediate procedures need to be backstopped by indigenous scholarship at the most basic levels. At the present time the need is not for large sums of money

to support teams of workers in extensive laboratories. Much more important at this stage is the careful identification of future leaders, the designing of appropriate training programs for them, and the provision of modestly equipped laboratories in which they can grow to full stature in the ever widening world of modern science.

## The Biological Basis of Behavior

NATIONAL RESEARCH COUNCIL

COMMITTEE FOR RESEARCH IN PROBLEMS OF SEX

Since its establishment in 1921, the Committee for Research in Problems of Sex of the National Research Council has supported more than 500 different research projects the results of which have been published in some 2,000 monographs and articles. With less than \$2,000,000 of total financial support for research, the committee has achieved an extraordinary record in opening up and developing a field of medical physiology previously neglected.

Many of the most significant advances in knowledge of the reproductive process, and in the ability of modern medicine to control its disorders and diseases, stem directly from the work of the committee. Fundamental studies supported by it have found applications of critical importance in the handling of a wide variety of problems ranging from those of animal husbandry to those raised by human sterility.

Recent developments in sociology and psychology which reveal the importance of sex problems to both the individual and the conduct of orderly social life, as well as the increasing availability of funds from other sources for physiological studies, have led the committee to a decision to devote the major part of its activities to the en-

couragement of research on the behavioral aspects of sex. The committee plans to stimulate greater exchange of information among investigators, to sponsor conferences and symposia, and to offer fellowships and research grants to both new and established scientists in the field.

In continued support of the Committee for Research in Problems of Sex, The Rockefeller Foundation made two grants to the National Research Council, Washington, D.C., during 1957. One of \$50,000 provided assistance during the year beginning July 1, 1957; the second, of \$225,000, extends that support through June 30, 1961.

#### UNIVERSITY OF SASKATCHEWAN

##### STUDY OF SCHIZOPHRENIA

In 1946 the province of Saskatchewan, Canada, conducted a survey which revealed that one-third of all patients in the mental institutions of the province suffered from schizophrenia, a disease about which relatively little was known. As the care of these patients alone involved an expenditure of \$50,000,000 a year by the province, a long-term study was initiated at the University of Saskatchewan, Saskatoon, in the hope that the biological and psychological alterations occurring in schizophrenics might be defined and specific guidance obtained as to their care and treatment.

The program, directed by Dr. A. Hoffer in the Department of Psychiatry, involves study of schizophrenic patients in three hospitals of the province, and includes provision for interviews with the patients and relatives at annual intervals or less as well as a record system which facilitates future correlation between the status of the patient outside the hospital and the treatment received during and after his hospital stay. Thus a substantial body of information on the history of schizophrenia outside a hospital environment is being compiled.

Of particular interest in the Canadian project is biochemical study of metabolic errors which may be a cause of schizophrenia. So far the group have discovered evidence which suggests that oxidative processes are disturbed in the blood of schizophrenics. During the next few years they plan to intensify their search for a biochemical key to schizophrenia by thorough probing of the complex metabolism of the aromatic amino acids and the development of more refined techniques for accurate identification of intermediary products in the body fluids of normal and schizophrenic persons.

Toward support of the research project at the University of Saskatchewan, The Rockefeller Foundation in 1957 made a further grant of C\$75,000 (about \$78,750), to be available during the next three years.

#### UNIVERSITY OF LONDON

#### BRAIN ULTRASTRUCTURE

The studies directed by Professor J. Z. Young at the University College, University of London, have followed three main avenues in an attempt to elucidate the structure and functioning of the brain. One group of investigators is concentrating on study of the brain as the principal organ of communication. Others are using the octopus in comparative behavior studies of memory and learning processes. Finally, the ultrastructure of the brain is being studied with a view to identifying, by means of the electron microscope, the finer changes in nerve cells that may well exist as the ultimate anatomical basis for the development of memory.

A Rockefeller Foundation grant of £10,000 (about \$29,000) to the University of London will be used to support Professor Young's research during the next two years.

## OTHER GRANTS

University of Lund, Sweden: research in endocrinology, under the direction of Professor Georg Kahlson, Physiological Institute; 68,000 Swedish crowns (about \$13,000) for a two-year period;

Kyushu University, Fukuoka, Japan: research in the Department of Physiology of the Faculty of Medicine, under the direction of Dr. Naoki Toida; \$10,000;

Tokyo Medical and Dental University, Japan: research in the Department of Physiology, under the direction of Dr. Susumu Hagiwara; \$10,000;

Keio University, Tokyo, Japan: research in the Department of Physiology of the School of Medicine, under the direction of Dr. Tsuneo Tomita; \$6,500;

Gunma University, Maebashi, Japan: research in the Department of Physiology, under the direction of Professor S. F. Takagi; \$6,000;

Professor Otto E. Lowenstein, Department of Zoology, University of Birmingham, England: to observe the planning and design of biological laboratories and recent advances in biological teaching and research in Sweden, Denmark, and the United States; \$4,700;

Dr. N. N. De, Central Drug Research Institute, Lucknow, India: to visit laboratories in the United States, Canada, and Europe; \$4,500;

Dr. William Trager, The Rockefeller Institute, New York, and Mrs. Trager: to conduct research at the West African Institute for Trypanosomiasis Research, Vom, Nigeria; \$3,375;

University of Vienna, Austria: research equipment for the Physiological Institute; \$3,300;

Dr. Samuel Rose, Department of Physiology, University of Melbourne, Australia: to visit physiological research centers in the United States and Canada; \$3,000;

Ronald Francis Woolmer, director, Department of Anesthetics, Royal College of Surgeons, London, England: to visit centers of anesthetics research in the United States; \$3,000;

Dr. Padmaker P. Lele, Neurological Research Unit, Indian Cancer Research Centre, Bombay: to visit leading neurophysiological centers in the United States and Canada; \$2,850;

Dr. Jorge Augusto Novis, professor of physiology, Faculty of Medicine, University of Bahia, Salvador, Brazil: to visit physiological centers in the United States and Canada; \$2,650;

West African Science Association, Achimota, Ghana: expenses of scientists invited to attend a conference on "The History of the West African Environment" held during March, 1958; \$2,500;

Dr. Lawrence Weiskrantz, Psychological Laboratory, University of Cambridge, England: to visit psychological laboratories in the United States and Canada; \$2,440;

Dr. David G. R. Ottoson, Physiological Department, Karolinska Institute, Stockholm, Sweden: to visit neurophysiological laboratories in the United States; \$1,430;

Dr. Reginald S. Hooper, Royal Melbourne Hospital, Australia: to visit neurosurgical centers in the United States; \$1,400;

Dr. Robert Staempfli, professor of physiology, University of the Saar, Saarbrücken, Germany: to serve as visiting professor in the Department of General and Animal Physiology, University of São Paulo, Brazil; \$800;

Dr. J. C. Watkins, Department of Physiology, Australian National University, Canberra: to visit research centers in the United States and Canada; \$650.

## General Biology

### UNIVERSITY OF SÃO PAULO

#### SCIENTIFIC RESEARCH

Since its establishment in 1934 as the first faculty in Brazil offering training in the liberal arts and sciences, the Faculty of Philosophy, Sciences, and Letters of the University of São Paulo has won international eminence for both the caliber of its instruction and the quality of the research conducted by its staff. To assist scientific research in 11 departments of the faculty, The Rockefeller Founda-

tion during 1957 appropriated \$120,000, available over a three-year period.

Almost one quarter of the Foundation's grant will be used to develop the university's Marine Biological Laboratory located on the coast at São Sebastião where the ocean fauna and flora are extraordinarily rich. This laboratory, together with two field stations of the university's Oceanographic Institute, have made Brazil a leader in Latin America in research on marine biology.

The balance of the Foundation's grant will be shared by the Departments of General Biology, General and Animal Physiology, Botany, Zoology, Biochemistry, Inorganic Chemistry, Physical Chemistry, Mineralogy and Petrography, Geology and Paleontology, and Physics. The researches on *Drosophila* population genetics and the effects of high energy radiations carried on in the Department of General Biology have achieved world-wide recognition. The Department of General and Animal Physiology, unique among its kind in Brazil, concentrates on study of invertebrate and vertebrate muscles using the techniques of electron microscopy and biochemistry, and on investigation of neurosecretory processes in certain invertebrates. In the other departments aided by the Foundation's grant important studies are in progress on such subjects as the water balance of the vegetation in different ecological situations, the taxonomy and ecology of fresh water and marine invertebrates, and the chemistry of organic sulphur compounds.

#### UNIVERSITY OF THE REPUBLIC

#### RESEARCH IN OBSTETRICAL PHYSIOLOGY

In their years of research in the field of obstetrical physiology, Dr. Roberto Caldeyro-Barcia and his colleagues at the Faculty of Medicine of the University of the Re-

public, Montevideo, Uruguay, have developed ingenious methods for the analysis of muscle contraction essential to adequate understanding of normal and abnormal uterine behavior. Their discoveries have attracted wide attention in the medical world, and form the basis of modern understanding of uterine behavior during the birth process.

Dr. Caldeyro-Barcia's plans for extending the work of his group during the next five years include studies of uterine contractility utilizing the mechanical methods already developed together with electrical recording of muscle action potentials. Special attention will be directed to the effects of abnormal contractions of blood flow in both mother and fetus—an investigation of particular importance in view of growing opinion that disturbances in fetal circulation may lie behind such grave congenital abnormalities as cerebral palsy and certain forms of feeble-mindedness.

Part of a 1955 Foundation grant to the University of the Republic was used for the research in obstetrical physiology. In 1957 the Foundation renewed its support of this work with a grant of \$75,000, available during a three-year period.

#### INSTITUTE OF BIOLOGY AND TECHNOLOGICAL RESEARCH

The Institute of Biology and Technological Research, Curitiba, Brazil, conducts studies relating principally to agriculture and animal husbandry in the State of Paraná and performs a number of analytical services for local industries. Some of its staff also teach in the Schools of Agriculture and Veterinary Science of the University of Paraná, which it adjoins.

The research program of the institute's Division of Animal Biology includes investigations of animal parasites and viruses, and of the leaf-cutting ant, one of the most

serious agricultural pests in the area. The Divisions of Plant Biology and of Soils are concentrating their attention on pathogens of economic crops and on the composition of arable soils in Paraná.

Under the direction of Dr. Metry Bacila, a graduate in medicine of the University of Paraná and a former Foundation Fellow, the Division of Experimental Pathology focuses its researches on the physiology of microorganisms. Dr. Bacila and his associates, in addition to their research, offer short intensive courses in the physiology of microorganisms at the Universities of São Paulo and of Paraná.

For the further development of research by the four divisions, for additional library materials, and for equipment and supplies for the photographic and scientific illustration laboratories, the Foundation in 1957 made a three-year grant of \$60,000 to the institute.

#### UNIVERSITY OF PALERMO

##### EMBRYOLOGY AND DEVELOPMENTAL PHYSIOLOGY

Italy's tradition of excellence in scientific research is being carried on today by such distinguished scientists as Professors Giuseppe Reverberi and Alberto Monroy of the University of Palermo. Professor Reverberi, director of the Institute of Zoology, is an authority on the embryology of tunicates, and includes in his research interests the role of enzymes in cellular differentiation, cytochemistry, and tissue specificity. Director of the Institute of Comparative Anatomy, Professor Monroy is concentrating on studies of early protein changes in the fertilized egg, the cortical reactions of the egg at the time of fertilization, and the activity of mitochondria during development.

Toward support of the research of Professors Reverberi and Monroy, both of whom are former Foundation

Fellows, The Rockefeller Foundation in 1957 appropriated \$30,000 to the University of Palermo.

#### UNIVERSITY OF EDINBURGH

##### EXPERIMENTAL ZOOLOGY

Under the leadership of Professor Michael Swann, research in the Department of Zoology of the University of Edinburgh has increasingly focused on the cell—its ultrastructure, chemistry and physiology, growth and differentiation, and function in the living animal. Among the projects currently in progress are studies of the mechanism of cell division, of the physiological functions of the cell membrane in relation to the organization of the cell as a whole, and of the changes in the immunological properties of the cell at different stages of the mitotic cycle.

The investigations of Professor Swann and his co-workers will be assisted during the next three years by a Rockefeller Foundation grant of \$25,000 to the University of Edinburgh, Scotland.

#### CALCUTTA SCHOOL OF TROPICAL MEDICINE

##### RESEARCH EQUIPMENT

At the Calcutta School of Tropical Medicine, India, research scientists are placing increasing emphasis on fundamental problems in tropical medicine. Some of the specialized equipment needed for new research projects will be purchased with the help of a two-year Foundation grant of \$25,000 to the school.

The School of Tropical Medicine, primarily a graduate research and training center, is supported and administered by the Government of West Bengal. It is adjacent to and cooperates with the Calcutta Medical College and the All-India Institute of Hygiene and Public

Health, and is affiliated scholastically with the University of Calcutta.

#### OTHER GRANTS

Kyoto Prefectural Medical College, Japan: research in the Department of Medicine, under the direction of Associate Professor Masasuke Masuda; \$10,000;

Lovanium University, Leopoldville, Belgian Congo: research in the Departments of Zoology, Biochemistry, and Physics; \$10,000;

University of Melbourne, Australia: research in experimental surgery in the Department of Surgery, by Dr. Georg Berci; \$10,000;

University of São Paulo, Brazil:

Toward support of the Science Development Program of the Brazilian Institute of Education, Science, and Culture; \$10,000;

Dr. Mario G. Ferri, professor of botany; to visit centers of research in plant physiology in Africa, Israel, Europe, and the United States; \$5,450;

University of Texas, Austin: research in ecology in the Institute of Marine Science, under the direction of Dr. Howard T. Odum; \$10,000;

University of San Luis Potosí, Mexico: teaching materials and the salary of one instructor for the departments of biology and physics of the Preparatory School; \$8,440;

University of Buenos Aires, Argentina: research in clinical medicine at the Center of Medical Investigations, under the direction of Professor Alfredo Lanari; \$8,200;

Gunma University, Maebashi, Japan: to complete and equip a new animal house for the Medical School; \$8,000;

University of Uppsala, Sweden: isotope measuring equipment for the Institute of Physiological Botany; \$6,000;

University of the Andes, Bogotá, Colombia: research in cell physiology in the Department of Biology, under the direction of Dr. F. R. Hunter; \$5,000;

Royal Faculty of Medicine, Baghdad, Iraq: development of basic research in the Medical Research Institute, under the direction of Dr. Mahmoud A. Jalili; \$5,000;

University of Cambridge, England: equipment for research in insect physiology in the Subdepartment of Entomology; \$4,500;

University of Camerino, Italy: equipment and supplies for research in experimental zoology, under the direction of Professor Enrico Urbani; \$4,000;

Makerere College, Kampala, Uganda: research equipment for use in the Department of Pathology; \$4,000;

Dr. Hiroshi Wako, Department of Pediatrics, Faculty of Medicine, Tohoku University, Sendai, Japan: to visit pediatric centers in the United States and Canada; \$3,800;

University of Vienna, Austria: equipment for research in plant cytology in the Institute of Botany, under the direction of Professor Lothar Geitler; \$3,600;

Dr. Kazimierz Sembrat and Dr. Zofia Sembratowa, University of Wrocław, Poland: to visit research laboratories in Europe; \$3,500;

Dr. Antoni Horst, rector, Medical Academy, Poznan, Poland: to visit centers of research in experimental medicine and occupational disease in the United States; \$3,200;

Kyoto University, Japan: equipment for research in the Department of Botany, under the direction of Dr. Joji Ashida; \$3,000;

Carlsberg Foundation, Copenhagen, Denmark: equipment and supplies for research in cytophysiology in the Institute of Biology, under the direction of Dr. Erik Zeuthen; \$3,000;

University of Palermo, Italy: Dr. Eizo Nakano, Biological Institute, Medical School, Nagoya National University, Japan; to study under Dr. Alberto Monroy and conduct research in the Institute of Comparative Anatomy; 1,320,000 Italian lire (about \$2,225);

University of Louvain, Belgium: research in muscle physiology, under the direction of Professor Xavier Aubert; 100,000 Belgian francs (about \$2,100);

Dr. Henrique da Silva Castro, Institute of Microbiology, University of Brazil, Rio de Janeiro: to conduct studies on streptococci at the Communicable Disease Center, Atlanta, Georgia; \$1,750;

Dr. Ian Wood, head, Clinical Research Unit, Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia: to visit centers of clinical immunology and gastroenterology in the United States; \$1,400;

Georgetown University, Washington, D.C.: research in the College Observatory, by Dr. Karoly Lassovszky; \$1,000;

Fund for grants of amounts not exceeding \$500 for allocation under the supervision of the Foundation's Director for Biological and Medical Research; \$2,195.

## Marine Biology

### MARINE BIOLOGICAL LABORATORY

Founded in 1888, the Marine Biological Laboratory at Woods Hole, Massachusetts, has become the foremost center in the United States for summertime research and training in biology. In 1956, for example, 444 investigators and students from 160 American and 15 foreign institutions came to the laboratory for research, for exchange of ideas and cooperative studies, and for the courses in zoology, embryology, physiology, botany, and ecology offered to advanced students.

The laboratory's library of some 85,000 volumes and 225,000 catalogued reprints is one of the world's best general collections in biology and, through careful planning, the laboratory has kept its acquisition of equipment in step with the ever increasing demands of modern science. To many scientists the laboratory offers associations, facilities, and research materials, such as forms of marine life, unavailable to them in their own institutions.

Although it is most active during the summer, the Marine Biological Laboratory has recently established a year-round group of investigators and made its facilities available during the winter to scientists on sabbatical leave. Its increasing use throughout the year and the allocation of space to major items of equipment have forced the laboratory in recent years to reduce the number of biologists it accepts during the summer session. In order to keep pace with the requests it receives for research space, the laboratory has now planned construction of a new building which will provide accommodations for 60 to 70 investigators each summer. One floor of the new building will be reserved for research in radiobiology, and will include closed circulation tanks for studying the turnover of radioactive substances in whole animals.

To help the Marine Laboratory construct and equip the new building, The Rockefeller Foundation in 1957 appropriated \$738,500, payable during the next two years if the laboratory secures an equal sum from other sources for the same purpose. Since 1922 the Foundation and the Rockefeller endowed General Education Board have granted \$1,549,900 toward support of the laboratory.

#### COLUMBIA UNIVERSITY

#### MARINE BIOLOGY

The Lamont Geological Observatory of Columbia University, under the direction of Dr. Maurice Ewing, is one of the world's most important institutions for the investigation of the structure and function of the ocean. The observatory has made significant contributions in ocean basin seismology, precision sounding, bottom sediment coring, gravity measurements, turbidity current, ocean bottom photography, the measurement of ocean temperatures, and

the SOFAR system of position finding by underwater sound transmission.

The presence of biological material in samples of sea-water and ocean floor sediment that had been collected for physical and chemical measurement led in 1954 to the inauguration of a supplementary research program on the biological productivity of the sea. The work in marine biology is contributing not only to further understanding of biological problems in themselves but also to the interpretation of such geological questions as the probable sites and dates of origin of the strata represented in "cores" of the sedimentary layer. The biological program is also closely linked with the observatory's geophysical studies involving the identification and chemical analysis of organisms found at various depths in the sea and in the mineral strata on the bottom.

In addition to land-based units, which include laboratories for physical, chemical, and micropaleontological studies, the observatory owns and operates a 202-foot three-masted schooner that is used extensively in gathering sea-water samples and other materials for research.

In support of the Lamont Observatory, The Rockefeller Foundation has appropriated \$300,000 to Columbia University, New York. One-third of the grant will be used to develop further research in marine biology, and the remaining \$200,000 will contribute to the observatory's endowment fund.

#### JAPAN METEOROLOGICAL AGENCY

##### MARINE BIOLOGY

Because the depth of the deepest trenches in the ocean floor exceeds by roughly 6,500 feet the height of the world's loftiest mountains, studies of the deep sea, the marine life it supports, and its influence on such phenomena as tidal

waves, have been relatively limited. As deep sea research progresses, however, scientists are increasingly impressed by the importance of deep waters to the entire biological and physical regime of the sea.

The exchange between deep and surface layers appears to influence the fertility of different parts of the ocean, and the circulation of ocean water from the tropics to the high latitudes is believed to play an important part in the determination of climate. Better knowledge of the migration and habits of marine life in the lower levels of the ocean may well have practical results in an augmented food supply for the world's growing population. Atomic wastes cannot safely be dumped in deep waters until further information is obtained concerning the contour of the ocean floor and the overturn of ocean waters.

The Japan Meteorological Agency, Tokyo, recently appointed a committee composed of Japan's most distinguished geophysicists, geochemists, ichthyologists, oceanographers, planktologists, microbiologists, biochemists, and marine biologists to plan and carry out research on the deep waters off the coast of Japan. In addition to its own facilities, the agency intends to employ the resources of the several institutions it operates and of various research laboratories in selected Japanese universities. To provide special deep sea equipment for one of the agency's ships, The Rockefeller Foundation has appropriated \$130,000, available over a two-year period.

#### UNIVERSITY OF MIAMI

#### MARINE BIOLOGY

Scientists interested in conserving and increasing marine food resources have devoted many studies to plankton—minute plants and animals which are grazed by larger organisms and on which all animal life in the sea ultimately

depends. However, few of these investigations have taken place in tropical waters, which are a less important source of edible fish, and which lack the spectacular plankton blooms of spring and summer familiar in temperate or relatively cold areas.

Recent evidence suggests that the infertility of tropical seas may be more apparent than real. Not only do they produce continuously throughout the year, but their higher temperatures may accelerate the life cycle so that "crops" of plankton and dependent organisms mature and are replaced more rapidly than elsewhere. If this hypothesis proves correct, vast oceanic areas will assume new importance in the effort to find new sources of food supply.

The Marine Laboratory of the University of Miami, established less than ten years ago, is one of the principal institutions investigating plankton growth and behavior in the tropics. In the next three years laboratory scientists will continue their researches on the physical characteristics of the warm Florida current, on the diurnal vertical migrations of plankton, and on plankton nutrition. Toward the costs of these studies the Foundation has appropriated \$90,000 to the University of Miami.

#### UNIVERSITY OF COPENHAGEN

##### MARINE BIOLOGY

The four Scandinavian countries, which in the past have made many valuable contributions to human knowledge of the sea, are currently sponsoring cooperative research on aquatic organisms in almost every type of natural environment. The Institute of Marine Research of the University of Helsinki is studying the biology of completely brackish water; Swedish scientists at the Kristineberg station are working with more typically marine populations and marine physiology; Norwegian investigators at Bergen

are studying plants and animals of the littoral zone and the open sea; and finally the Marine Biological Institute of the University of Copenhagen is exploring the life of the Öre Sound, including its upper, brackish, north-running surface waters and deeper, more salty, south-running currents.

The Danish institute recently received a government grant for the establishment of a new marine biology laboratory at Elsinore, on the shore of the Öre Sound. The new unit, to be used as a training as well as a research center, will be shared by students and staff of the Universities of Copenhagen and of Lund, Sweden.

Toward the costs of a specially equipped collecting boat for the new station, the Foundation has appropriated \$30,000 to the University of Copenhagen.

#### OTHER GRANTS

University of Chile, Santiago: equipment and supplies for studies in marine biology and oceanography at the Marine Biological Station, Montemar; \$10,000;

University of Aix-Marseilles, France: equipment for research in the Marine Station, Endoume, under the direction of Professor Jean Pérès; \$5,000.

## Genetics

### UNIVERSITY OF RIO GRANDE DO SUL

#### RESEARCH IN GENETICS

Studies of the population genetics of *Drosophila*, a class of insects very frequently used to study heredity, have developed into one of the main research interests of the Faculty of Philosophy at the University of Rio Grande do Sul, Pôrto Alegre, Brazil.

The university currently plans to obtain a neutron source for its Physics Research Center primarily for use in the genetics program. Mutations will be induced in *Drosophila* species and the mutants will be introduced among *Drosophila* populations on some of the isolated forest islands off the coast of southern Brazil. The genetic effects of crossbreeding will be observed and recorded.

Also in the next few years university scientists will begin research in human genetics, probably among the Indian populations in the southwestern part of the country. In support of these and investigations in four other basic science departments the Foundation in 1957 made a three-year grant of \$80,000 to the University of Rio Grande do Sul.

#### NATIONAL INSTITUTE OF GENETICS

##### RESEARCH IN ANIMAL GENETICS

The Rockefeller Foundation has made a three-year grant of \$52,000 to the National Institute of Genetics, Misima, Japan, for a program of research in animal genetics, particularly the effects of nuclear radiation on genetic structure. Participating scientists will include Dr. T. H. Yosida, whose specialties are chromosome numbers and cancer cytology; Dr. Y. Tazima, a silkworm geneticist whose work on sex determination has attracted wide attention; Dr. T. Sugahara, a graduate in medicine who is also trained in physics; and Dr. M. Tsujita, who specialized in biochemical genetics at Columbia University, New York, and who now heads the institute's Department of Biochemical Genetics.

Available at the institute for use in the program are animal and insect colonies, space and equipment for isotope work and for tissue culture, and well-constructed facilities for gamma radiation using Cobalt 60. Foundation funds

will be used for additional equipment and supplies, the salaries of special assistants, and other lesser expenses.

#### COLUMBIA UNIVERSITY

##### RESEARCH IN HUMAN GENETICS

The Institute for the Study of Human Variation at Columbia University, New York, was founded several years ago to apply basic theoretical knowledge of genetics to the complex and pressing problems of human genetics. It has made an important contribution to the field through its studies of the inheritance of blood proteins—elements easily identified in the laboratory which obey genetic rules of the same simplicity and precision exhibited by known "marker" genes of experimental animals. Seminars held by the institute for scientists interested in the problems of human variation have aroused the cooperative interest of a larger number of investigators from widely separated fields. Through a graduate training program, the institute is helping to prepare younger scientists for future roles in research on human genetics.

To help support the genetics research program, The Rockefeller Foundation has made \$37,000 available for a three-year period to the Institute for the Study of Human Variation.

#### OTHER GRANTS

##### University of Wisconsin, Madison:

Research in genetics, under the direction of Professor Joshua Lederberg; \$14,000 for a two-year period;

Dr. James F. Crow, professor of genetics; to visit Japan to complete work on a book on population genetics in collaboration with Dr. Motoo Kimura, National Institute of Genetics, Misima; \$2,550;

University of Minas Gerais, Belo Horizonte, Brazil: research in cytology and genetics in the Institute of Biology, Faculty of Philosophy; \$9,000;

University of São Paulo, Brazil: initiation of a research program in human genetics in the Department of General Biology, under the direction of Professor Crodowaldo Pavan; 450,000 cruzeiros and \$1,000 (about \$8,650);

University of Edinburgh, Scotland: equipment for the Institute of Animal Genetics; \$8,500;

Child Research Center of Michigan, Detroit: research on the genetics of sickle cell anemia and allied disorders; \$8,000;

University of Pavia, Italy: research on the genetics of the housefly in the Institute of Zoology; 4,500,000 Italian lire (about \$7,425) for a three-year period;

Osaka University, Japan: construction and equipment of an insectary, under the direction of Professor H. Kikkawa; \$5,000;

University of Paraná, Curitiba, Brazil: research in genetics, under the direction of Professor Newton Freire-Maia, Department of General Biology, Faculty of Philosophy; \$5,000 for a two-year period;

Dr. Adrienne Ficq, Laboratory of Animal Morphology, University of Brussels, Belgium: to participate in studies on the cytology of chromosomes at the University of São Paulo, Brazil; \$1,650.

## Biochemistry

### COLUMBIA UNIVERSITY

#### BIOCHEMISTRY

The Department of Biochemistry at Columbia University, New York, has traditionally encouraged the pursuit of research in a variety of fields, and such distinguished investigators as Dr. David Shemin, Dr. E. Chargaff, and

Dr. Zacharias Dische are contributing to its unusual record of accomplishments.

Dr. Shemin is engaged in analyzing the biosynthesis of the complex molecules known as porphyrins which enter into the composition of hemoglobin and various oxidative enzymes. Dr. Chargaff, who specializes in nucleoproteins, is working with the large mucolipids found in the nervous system; in collaboration with the Department of Microbiology, he has recently shown that these macromolecules inhibit the hemagglutinating ability of influenza virus. Dr. Dische is investigating the relationship of the phosphorylated six-carbon sugars with the five-carbon ones so important in the structure of nucleic acids.

In the years since 1934 The Rockefeller Foundation has appropriated more than \$500,000 to Columbia University for research in the general field of biochemistry. A new outright grant of \$75,000 will be combined with the remaining balance from a previous appropriation to provide a flexible research fund for the department.

#### OSAKA UNIVERSITY

#### PROTEIN RESEARCH

Osaka University, Japan, has organized a new Laboratory of Protein Research where biochemists from the Medical and Dental Schools, the Faculty of Science, and the Institute for Microbial Diseases will work together in a coordinated study program.

Dr. Shiro Akabori has been appointed director of the new unit, which has been housed in a remodeled building near the medical and science facilities. Dr. Akabori and other distinguished chemists of the senior staff will be assisted by several well trained younger biochemists on full-time appointments, by postgraduate fellows, and by graduate students.

To assist in the development of the laboratory by providing some of the elaborate equipment necessary for advanced biochemical investigation, the Foundation has made a one-year grant of \$50,000 to Osaka University.

#### UNIVERSITY OF CAMBRIDGE

##### BIOCHEMISTRY

The School of Biochemistry at the University of Cambridge, England, long recognized as one of the world's great biochemical research centers, is justly famous for its investigations of the structure and function of biologically important molecules. Emphasized in its broad research program are studies of proteins, carbohydrates, hormones, enzymes, plants, and bacteria.

For additional equipment for the School of Biochemistry, including a Beckman recording spectrophotometer, an automatic gas flow counter for radioactive isotope measurements, and a bench-type electron microscope, the Foundation has made a two-year grant of \$36,000 to the University of Cambridge. Some of these instruments will duplicate apparatus already on hand but in constant demand by a very large group of independent investigators.

#### UNIVERSITY OF GÖTEBORGS

##### CYTOCHEMISTRY

In part because of the technical difficulty of working with nervous tissue, knowledge of the chemical architecture of nerve cells has had to await the development of techniques which make possible work on the minute scale required for study of a single cell. One of the first groups to develop such techniques is that directed by Professor Holger Hydén at the University of Göteborg Medical School. Now under investigation by the group are such sub-

jects as the composition of nerve cells with different specific functions; variations in the chemical composition of cells with age; chemical changes associated with nerve stimulation or injury; and the distribution and character of enzymes within nerve cells.

To help defray the costs of the researches in cytochemistry conducted by Professor Hydén and his colleagues, The Rockefeller Foundation in 1957 made a three-year grant of \$36,000 to the University of Göteborg, Sweden.

#### UNIVERSITY OF UTAH

#### ENZYME CHEMISTRY

Within the past few years the biochemistry laboratory directed by Professor Emil Smith at the University of Utah has recorded two major achievements—the isolation and purification of the enzyme leucine aminopeptidase and a preliminary analysis of the structure of the enzyme papain. Leucine aminopeptidase promises to prove highly useful as a method for classifying different structural types of proteins, and also for determining the existence and position of particularly effective regions of physiologically active proteins such as enzymes and hormones.

The fact that two-thirds of the papain molecule can be destroyed without affecting its characteristic activity has led Professor Smith to speculate that perhaps the relatively large size of most enzymes is more or less irrelevant to their specific action, and he plans to devote a major part of his research activities during the next few years to further examination of this possibility.

Toward the general research expenses of the biochemistry laboratory during the next five years, The Rockefeller Foundation has appropriated \$35,000 to the University of Utah, Salt Lake City.

**FEDERAL TECHNICAL INSTITUTE****BIOCHEMISTRY AND PHYSICAL ORGANIC CHEMISTRY**

Generous gifts from several Swiss pharmaceutical firms and other Swiss sources have enabled the Federal Technical Institute, Zurich, to staff, house, and partially equip a new Department of Biochemistry. To provide additional research apparatus for the department, as well as a small high-resolution magnet for the subdepartment of physical organic chemistry, the Foundation has made a two-year grant of \$33,000 to the institute.

Professor Carl Martius of the University of Würzburg, Germany, was appointed head of the new biochemistry unit in 1956. At Zurich he will collaborate with such organic chemists as Professors L. Ruzicka and V. Prelog—known for their research on the structure and synthesis of steroids, hormones, and other natural products—in the institute's distinguished School of Organic Chemistry. The program of Professor Martius and his associates will be more specifically dedicated to chemistry at the cellular and the physiological level.

Research on the physical chemistry of organic compounds is under the general direction of Professor Hans Gunthard.

**UNIVERSITY OF ADELAIDE****STRUCTURE OF NUCLEIC ACID**

Since his recent appointment to the chair of physical and inorganic chemistry at the University of Adelaide, Australia, Professor D. O. Jordan has directed the research on the physical chemistry of nucleic acids and related compounds. He and his associates are studying the structure of nucleic acid by controlled procedures designed to disrupt its internal chemical bonds in a series of steps and to determine

the degradation product formed at each stage. Other members of his group, approaching the problem from the reverse direction, are investigating the means by which similar fragments of large molecules join together to form long chains, a process known as polymerization.

Toward the general expenses of Professor Jordan's research, The Rockefeller Foundation has made a three-year grant of \$27,500 to the University of Adelaide.

#### UNIVERSITY OF CAMBRIDGE

##### BIOCHEMISTRY OF REPRODUCTION

Although the biochemical factors affecting fertility are a part of the general population problem, only a small number of scientists are conducting basic research in the field. One of the foremost of these is Dr. Thaddeus R. R. Mann, whose posts as reader in the physiology of animal reproduction at the University of Cambridge's new School of Veterinary Medicine and as director of the Agricultural Research Council's Unit of Animal Reproduction give him almost unparalleled opportunities for research. The importance of Dr. Mann's contributions to knowledge of the biochemistry, metabolism, and nutrient requirements of mammalian ova and spermatozoa was recognized in 1956 when the American Academy of Arts and Sciences awarded him its septennial Francis Amory prize.

In support of Dr. Mann's research activities, The Rockefeller Foundation has made a grant of \$25,000 for use by the University of Cambridge, England, during a three-year period.

#### UNIVERSITY COLLEGE

##### RESEARCH IN BIOCHEMISTRY

Although it has long been known that charged inorganic ions are arranged asymmetrically across cellular

membranes, no fully satisfactory theory has been found to account for this observed asymmetry and to determine the source of the large amount of work required to produce it. One of the outstanding workers in the field, Professor E. J. Conway, has devoted the major part of his scientific career to study of the movement of ions across the membranes surrounding living cells and to efforts to uncover the nature and principles underlying the process of accumulation and exchange of inorganic ions in cells and tissues.

To help Professor Conway continue his research during the next three years, The Rockefeller Foundation has appropriated \$12,000 to the University College, Dublin, Ireland.

#### OTHER GRANTS

University of Parma, Italy: research on naturally occurring substances of biological importance, under the direction of Professor Vittorio Erspamer, Institute of Pharmacology; \$18,000 for a three-year period;

University of Vienna, Austria: equipment for research on the chemistry of proteins, under the direction of Professor Friedrich Wessely, Second Chemical Laboratory; \$18,000 for a two-year period;

University of Louvain, Belgium: research in biochemistry, under the direction of Professor Christian de Duve, Laboratory of Physiological Chemistry; \$15,000 for a two-year period;

University of Lund, Sweden: research on the synthesis of biologically active compounds in the Institute of Biochemistry, under the direction of Dr. Gösta Ehrensvärd; \$15,000 for a two-year period;

The Council for International Organizations of Medical Sciences, Paris, France: expenses of the members of a seminar on abnormal hemoglobins held in the Middle East during 1957; \$10,000;

University of Heidelberg, Germany: research on the chemistry of biologically active compounds, under the direction of Dr. Friedrich Cramer, Chemistry Institute; \$10,000;

Kyoto University, Japan: equipment and supplies for research in the Department of Biochemistry, under the direction of Dr. Osamu Hayaishi; \$10,000;

Robert College, Istanbul, Turkey: equipment and supplies for the Departments of Physics and Chemistry; \$10,000;

University of San Marcos, Lima, Peru: research in cell metabolism in the Institute of Biochemistry and Nutrition, Faculty of Medicine, by Dr. Marino Villavicencio; \$9,000;

Victoria University of Manchester, England: research on the bio-synthesis of organic compounds, under the direction of Professor A. J. Birch; £2,500 (about \$7,250);

University of Valle, Cali, Colombia: a conference on nutritional deficiencies in the Americas, to be held under the auspices of the Faculty of Medicine during 1958; \$7,200;

University of Buenos Aires, Argentina:

Research in the Institute of Physiology, Faculty of Medicine, under the direction of Professor E. Braun Menéndez; \$7,000;

Research in enzyme chemistry in the Department of Biochemistry, under the direction of Professor Andres O. M. Stoppani; \$3,920;

University of Camerino, Italy: equipment and supplies for use in the Institute of Biological Chemistry, under the direction of Professor Noris Siliprandi; \$5,000;

Rutgers, The State University, New Brunswick, New Jersey: research in the Institute of Microbiology, under the direction of Dr. Walter J. Nickerson; \$5,000;

Tokyo University, Japan: research in the Department of Chemistry, under the direction of Dr. Nobuo Tamiya; \$5,000;

Dr. Jozef Heller, director, Institute for Biochemistry, Polish Academy of Sciences, Warsaw: to study experimental methods and research developments in biochemistry in the United States; \$3,525;

University of Pavia, Italy: research in cytochemistry in the Institute of Comparative Anatomy; \$3,500;

Mercedes and Martin Ferreyra Institute for Medical Research, Córdoba, Argentina: equipment and supplies for research in hormone biochemistry; \$3,000;

Professor Armas Vihti Viartainen, professor of pharmacology, University of Helsinki, Finland: to visit departments of pharmacology and biochemistry in the United States; \$3,000;

Dr. Włodzimierz Niemierko, head, Department of Biochemistry, Nencki Institute of Experimental Biology, Warsaw, Poland: to visit biochemical laboratories in the United States; \$2,950;

Dr. N. B. Inamdar, Institute of Science, Bombay, India: to visit zoological laboratories in North America and Europe; \$2,800;

Lister Institute of Preventive Medicine, London, England: equipment for the Department of Biochemistry; \$2,500;

Dr. Francisco J. S. Lara, assistant in biochemistry, Faculty of Medicine, University of São Paulo, Brazil: to visit the Edsel B. Ford Institute of Medical Research, Detroit, Michigan; \$2,000;

Dr. Alan John Thomas, Department of Agricultural Chemistry, University College of North Wales, Bangor, and Mrs. Thomas: to visit biochemical research centers in the United States; \$1,800;

Dr. Kunio Yagi, assistant professor of biochemistry, Medical School, Nagoya National University, Japan: to visit research centers in the United States; \$1,800;

University of London, England: research in plant physiology in the Department of Botany, University College, under the direction of Dr. Leslie Fowden; £600 (about \$1,740);

Dr. Geoffrey M. Badger, head, Department of Organic Chemistry, University of Adelaide, Australia: to visit major research centers of organic chemistry in the United States and Canada; \$1,400;

Dr. John R. Totter, Biology Division, Oak Ridge National Laboratory, Tennessee: to visit the Faculty of Medicine, University of the Republic, Montevideo, Uruguay; \$1,100;

Professor Tetsuo Nozoe, Tohoku University, Sendai, Japan: to visit research centers in the United States and Canada; \$1,000;

Dr. Richard Morrin Acheson, senior research officer, University of Oxford, England: to visit research centers in the United States and Canada; \$900;

Dr. Ikuo Yamashina, professor of biochemistry, Kanazawa University, Japan: to visit biochemical research centers in the United States; \$900.

## Biophysics

### UNIVERSITY OF LONDON

#### BIOPHYSICS

In 1947 Professor J. T. Randall at King's College of the University of London began a research program designed to apply the exacting techniques of physics to such biological problems as cell division, the submicroscopic anatomy of the cell, and the response of the living organism to its physical environment. Investigators in the biophysics research unit which developed under Professor Randall's leadership now concentrate on four principal subjects: the structure and function of nucleic acids; the architecture of collagen systems; the fine structure of muscle and the mechanism of muscular contraction; and the nature of visual perception.

Professor Randall and his colleagues were among the first to use X-ray diffraction techniques to elucidate the basic helical structure of desoxyribonucleic acid (DNA), and are now engaged in efforts to relate the structure of DNA to its role in inheritance and in the synthesis of proteins. Other members of the unit are applying X-ray diffraction analysis and electron microscopy to study of isolated molecular chains of collagen and of model collagen systems, and are conducting parallel analyses of collagen proteins obtained from different sources in an attempt to

establish the range of chemical composition within the known framework of collagen structure.

A third group of workers at King's is examining the ultrastructure of contractile tissues and the properties of the protein systems composing it, and giving special attention to a detailed comparison of the submicroscopic organization of different smooth muscles and to the helically wound myofibrils which occur in some of them. A fourth team is studying visual perception with a view to determining the processes whereby information presented at different points or at different times in the visual field is combined and compressed into the nerve "message" transmitted to the brain.

To assist the work of the biophysics research unit, The Rockefeller Foundation in 1957 appropriated \$121,000 to the University of London, England. The new grant, available through the period ending September 30, 1960, brings to a total of \$288,400 the amount contributed by the Foundation in support of the unit since 1947.

#### UNIVERSITY OF UPPSALA

#### BIOLOGICALLY IMPORTANT MOLECULES

Under the leadership of Professor Kai Siegbahn, biophysicists in the Physics Institute at the University of Uppsala, Sweden, are collaborating in an interdepartmental study of biologically important molecules. Also participating in the project are X-ray spectroscopists under the direction of Professor Gunnar Hägg, medical chemists under Professor Einar Stenhagen, and the many colleagues of Professor Arne Tiselius in the Institute of Biochemistry who are interested in the structure and behavior of proteins.

Professor Siegbahn and his associates are contributing to the program their skills in the analytic methods of electron spin and nuclear magnetic resonance. These new tech-

niques, products of the radar age and of atomic physics, employ high-frequency radio energies to measure magnetic moments and the movement of electrons in molecules.

For a heavy magnet of great homogeneity which will permit more exact quantitative work in resonance analysis, the Foundation has appropriated \$35,000 to the University of Uppsala.

#### UNIVERSITY OF LEEDS

##### BOTANY

A grant of £12,000 (about \$34,000) will assist the University of Leeds, England, to purchase and install an electron microscope in the Department of Botany. The equipment will be used for research on the ultrastructure of plant tissues under the direction of Professors Irene Manton and Reginald D. Preston.

The scientists led by Professor Manton have investigated the structure and behavior of plant cilia, of the motile spermatozoids of marine algae, of chromosomes in ferns, and of plankton microorganisms. Professor Preston and his colleagues have paid particular attention to the nature of the plant cell wall, especially in algae. Their published studies in this field have won wide international recognition.

#### KAROLINSKA INSTITUTE

##### CELL RESEARCH

Recently the group directed by Professor T. Caspersson at the Institute for Cell Research of the Karolinska Institute developed a universal ultramicrospectrograph which is capable of shortening the time of observation and computation in certain types of cell research approximately a hundredfold. Having as its most important feature the

ability to compensate for errors which arise from such factors as differences in thickness of cellular elements, the new ultramicrospectrograph is expected to contribute importantly to the institute's researches by making possible observation not only of the chemical behavior of the whole cell but also of differentiated sites within it.

To make possible expanded research with this instrument, and the continuation of the informal collaboration Professor Caspersson has developed with the Max Planck Institute for Marine Biology in Wilhelmshaven, Germany, The Rockefeller Foundation has made a three-year grant of \$30,000 to the Karolinska Institute, Stockholm, Sweden.

#### OTHER GRANTS

University of Buenos Aires, Argentina: research expenses in the Institute of General Anatomy and Embryology, Faculty of Medicine; \$15,000;

University of Oxford, England: research in crystallography, under the direction of Dr. Dorothy Crowfoot Hodgkin, Laboratory of Chemical Crystallography; \$15,000;

University of Chile, Santiago: research in radiobiology in the Laboratory of Nuclear Physics, under the direction of Dr. George Hodgson; \$10,000;

Dr. Goetz W. Richter, assistant professor of pathology, School of Medicine, Cornell University, New York: to visit European laboratories to study electron microscopy methods; \$4,350;

University of Bern, Switzerland: equipment for the Institute of Crystallography; \$3,200;

Dr. Aaron Klug, Department of X-ray Crystallography, Birkbeck College, University of London, England: to visit research centers in virology and crystallography in the United States; \$3,100;

University of São Paulo, Polytechnic Institute, Brazil: equipment and supplies for use in the Electron Microscopy Laboratory, under the direction of Mrs. Helena Souza Santos; \$2,500;

Dr. J. S. Robertson, Marks Professor of Pathology, University of Adelaide, Australia: to visit centers of electron microscopy in the United States and Canada; \$1,600;

Dr. Beatrice S. Magdoff, Boyce Thompson Institute for Plant Research, Inc., Yonkers, New York: to visit laboratories of X-ray crystallography in England; \$1,500;

The Royal Society, London, England: travel expenses of British delegates to the IV International Congress of the International Union of Crystallography; £500 (about \$1,425).

## Virology

### ISRAEL FOUNDATIONS TRUSTEES

#### RESEARCH IN VIROLOGY

Studies conducted in both The Rockefeller Foundation's own virus laboratories and in other centers of virology throughout the world seem increasingly to support the emerging hypothesis that prior infection with one of the arthropod-borne (arbor) viruses may lead to the development of immunity against a number of other related viruses. The State of Israel offers unusual opportunities for exploration of this hypothesis. Only one arbor virus, West Nile, has been identified as occurring naturally in the country, and the great majority of recent immigrants come from areas which are free of infection with arbor viruses and therefore lack immunity.

For some years Dr. Natan Goldblum, director of the Virus Laboratory of the Ministry of Health, has been engaged on studies of the epidemiology of West Nile fever which have contributed greatly to understanding of the clinical aspects of the disease and its behavior in nonimmune populations. In the next few years he plans to continue this research and to undertake field study of the possible devel-

opment of cross immunity to several viruses as a result of infection with only one. To help finance this research during a two-year period, the Foundation in 1957 appropriated \$62,000 to the Israel Foundations Trustees, Jerusalem.

#### BIOLOGY INSTITUTE OF BAHIA

##### RESEARCH IN ANIMAL VIROLOGY

Since its establishment in 1949 the Biology Institute of Bahia, Salvador, Brazil, has rapidly developed its research functions and services, including the provision of vaccines and other biologicals to the agriculturists and livestock producers of the state. Among the research programs in progress at the institute are studies of rabies, which causes heavy losses of cattle in Bahia, and of eastern equine encephalitis, also a serious disease of animals in the area.

In recent years virologists at the institute isolated the virus of eastern equine encephalitis from the first human being known to have died from the disease in Bahia. Toward the costs of a continued search for this virus in mosquitoes, normally the vectors, and for the virus or the antibodies that indicate its previous presence in man, and in support of other investigations at the Biology Institute, the Foundation has made a five-year grant of \$28,000.

#### THE VIRUS RESEARCH PROGRAM

For this report, see pages 29-45 of The President's Review.

#### OTHER GRANTS

Pasteur Institute, Paris, France: expenses of an international symposium on bacteriophage; \$6,200;

Dr. P. A. D. Winter, Poliomyelitis Research Foundation Laboratories, Johannesburg, Union of South Africa: to visit laboratories in the United States and Canada; \$5,000;

University of Cambridge, England: publication by the Cambridge University Press of a book on *Aedes aegypti* by Sir Rickard Christopher; £1,500 (about \$4,275);

Dr. Henry Makower, Hirschfeld Institute of Immunology, Polish Academy of Sciences, Wrocław: to visit virus laboratories in the United States; \$3,450;

Dr. James Stuart Porterfield, Department of Bacteriology and Virus Research, National Institute for Medical Research, London, England: to visit virus laboratories in New York and Trinidad; \$3,000;

Dr. Maria Brasil Esteves, Department of Microbiology, Paulista School of Medicine, São Paulo, Brazil: to undertake studies of the poliomyelitis virus at the Johns Hopkins University, Baltimore, Maryland; \$2,150;

Dr. H. J. F. Cairns, senior research fellow, John Curtin School of Medical Research, Australian National University, Canberra: to visit virus laboratories in the United States; \$1,875;

Dr. Sunthorn Sribongse, Bangkok, Thailand: to visit leading virological centers in the United States and other countries en route to Thailand; \$985;

Arthur Greenhall, curator, Royal Victoria Institute Museum, Port-of-Spain, Trinidad: to visit research centers in the United States; \$650;

Dr. Robley C. Williams, Virus Laboratory, University of California, Berkeley: to extend a research visit to the Virus Research Unit, Molteno Institute, University of Cambridge, England; \$525.

## **Agriculture**

**AGRICULTURE**

*Major Interests, 1957*

Aid to Research and Teaching .....	\$2,401,500
Grants with Long-Range Relation to World's Food Supply .....	78,500
Operating Programs .....	2,048,400
Fellowships .....	693,000
Grants in Aid .....	400,000

## AGRICULTURE

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THE WORLD'S DEMAND for food mounts each year, notwithstanding the apparent anomaly of surplus supplies in a few areas. This demand reflects not only the very significant population increase in almost every country in the world, but also the necessity for better nutrition to support human well-being and productive capacity. Current rates of world population growth justify the judgment that the need for more feeds and foodstuffs will continue to mount during the years to come.

The agricultural program of the Foundation seeks, as do the other Foundation programs, to contribute to basic human needs whether they be in the area of the social sciences, the humanities, the medical, or the natural sciences. Man's physical well-being is fundamental to his totality as an individual, and history has shown that an underfed people is not only an unhappy one but also frequently an explosive one. If individual members of society are to contribute their modicum to human progress, their most basic needs must first be satisfied. Although The Rockefeller Foundation recognizes that its role in this enormous world problem can at best be only a modest one, it believes that sound progress may in the last analysis be to a large degree the combined effect of many modest efforts. The Foundation has selected as its principal area of concentration in agriculture an interrelated series of programs and projects directed toward

the production of knowledge and materials which can be advantageously employed to improve and increase world food production.

The Foundation's program in agriculture is international in scope and intent. The core effort involves the training of scientists through formal or informal exchange of scholars at various levels of professional and scientific development. As a result, each year significant numbers of scientists from many countries travel to other countries where they can obtain those types of experience considered to be most useful in their future professional activities. The place and type of experience planned for the individual varies widely with opportunity and individual needs. In each case an effort is made to assure that the trainee or visitor will have opportunities to contribute, in some way, of his own experience, culture, and ideals to his colleagues in another country. In numerous instances scholars are given special support on their return to their countries to enable them to take maximum advantage of ideas and techniques gained abroad.

Cooperative field operations provide another approach to the training of young scientists. The Foundation now engages in four—three in Latin America and one in Asia—which are essentially research programs dealing with those problems of greatest importance to food production in the countries concerned. In each instance, although the Foundation does participate directly through its own field staff, the larger group involved invariably consists of local scientists who act initially as in-service trainees, later as staff members, and ultimately as the responsible leaders of all aspects of the operation. Selected individuals from these groups are given opportunities for advanced training abroad and upon their return participate in training younger generations of agricultural scientists.

Closely related to the above activities is a grants pro-

gram in agriculture which involves the partial support of diverse research activities in many parts of the world. In each case the decision to grant support follows the judgment that the individual or group concerned is engaged in scientific work of fundamental importance to the long-range benefit of agricultural production. The spectrum is broad and includes projects dealing with microbiology, cytology and genetics, plant and animal protection, plant physiology and biochemistry, soil science, animal nutrition and pathology, and certain less conventional projects in marine biology, the economic applications of solar energy, arid lands research, and water resources. In this program also there is emphasis on training since in almost every instance young scientists who have not yet obtained full professional stature are associated with the research projects and gain experience and understanding while contributing to them.

Results of the Foundation program in agriculture are already apparent. In more than 40 countries returned fellows or scholars are actively engaged in agricultural research, training, or development programs which are having an impact on local science and economy. Most of these individuals are, or are becoming, leaders in their fields of specialization, and are thus influencing the orientation of local programs and the training of younger scientists. Frequently their research activities are of such quality that they merit consideration for the further Foundation support of grants for research and development.

The grants program is visibly contributing to certain aspects of agricultural development on an international scale. Support of work in the broad field of plant physiology at a number of leading institutions has helped to contribute to a deeper understanding of plant function and of various methods for crop improvement. Arid lands research is helping to clarify the problems which confront man when he attempts to utilize semi-desert soils for agricultural pro-

duction. Support of research in microbiology has resulted in new knowledge of host-parasite relationships, the interaction of microorganisms in soil, antibiotic phenomena, and general microecology. Research in animal science has brought nearer to solution many of the more important problems in animal physiology and nutrition, animal genetics, and animal physiology. Contacts which the Foundation has encouraged between institutions where such research is in progress have helped to stimulate international cooperation in these and related fields.

The agricultural operating programs in which the Foundation participates have proved an especially effective means of contributing to food production both locally and internationally. Concentrated and cooperative effort toward the solution of local food production problems has led to significant increases in major food crops. The interest aroused in neighboring countries by these increased yields has resulted frequently in international collaboration whereby the benefits of a single program are extended into contiguous areas. In Latin America a number of international programs involving such basic food crops as wheat, corn, beans, and potatoes have been initiated. These international projects have made important contributions to the control of stem rust of wheat and late blight and virus diseases of the potato, to the development of fertility and management practices leading to greater yields, and to the breeding and multiplication of improved crop varieties for increased production.

On the basis of its experience during the past 15 years, the Foundation believes that this integrated international approach to agricultural science has been effective as one means of contributing to world food production. It is hoped that during the years to come these early efforts will produce ever increasing dividends to agricultural science and production.

## Aid to Research and Teaching

CENTRAL UNIVERSITY OF ECUADOR

FACULTIES OF AGRONOMY AND VETERINARY  
MEDICINE

Ecuador, an agricultural country with many of its resources for food and animal production still untapped, has been giving increasing support to local agricultural research and teaching in the past several years. One of the most recent examples was a government allocation to the Central University of Ecuador, Quito, for a new building to house its Faculties of Agronomy and Veterinary Medicine. The \$300,000-building, greenhouses, and other lesser facilities will be constructed on a 20-acre tract on the outskirts of Quito, part of a new campus to which the entire university eventually will be transferred. About six miles from the city a supplementary agricultural experiment station has also been planned.

The Faculties of Agronomy and Veterinary Medicine in the past have stressed vocational education but now are reorganizing to give much more attention to basic research. Additional full-time professors will be appointed, and the student body, presently numbering about 250, will be enlarged.

The Rockefeller Foundation has been cooperating in agricultural education and research in Ecuador through special training appointments and through its operating programs in Latin America. The Colombian Office of Special Research is assisting in the wheat improvement experiments of the National Wheat Commission, and the Mexican Office of Special Studies has sent to Ecuador many improved varieties of corn, some of which are now being utilized effectively in the subtropics.

Toward teaching expenses and for equipment and sup-

plies for the expanded Faculties of Agronomy and Veterinary Medicine of the Central University, the Foundation in 1957 made a five-year grant of 1,270,000 sures and \$225,000 (approximately \$300,000).

#### UNIVERSITY OF SÃO PAULO

##### LUIZ DE QUEIROZ COLLEGE OF AGRICULTURE

The Luiz de Queiroz College of Agriculture, Piracicaba, Brazil, a division of the University of São Paulo, is advantageously located in, and well supported by, one of the outstanding agricultural states of Brazil. Over the years it has developed an excellent physical plant and assembled a full-time faculty with high professional standing throughout Latin America.

Through its teaching staff of approximately 40, the school offers its 300 students a broad curriculum in the agricultural sciences in preparation for future responsibilities in government service, other institutions, and private enterprise. Currently it is planning to strengthen its program further through an International Cooperation Administration contract with Purdue University under which some 16 Purdue professors will come to Piracicaba in the next several years while members of the Brazilian faculty travel and study in the United States. Also in the near future the college will develop a graduate curriculum which is expected to benefit Brazilian agriculture and to attract increasing numbers of students from other Latin American countries.

The research program of the Piracicaba school emphasizes genetics, entomology, soils, biochemistry, statistics, and horticulture. Visiting professors from the Universities of California and Nebraska, the Iowa State College, and the University of Munich have participated in the program in the past, spending periods in residence at Piracicaba cooperating with local staff members. In addition, the col-

lege has collaborated with other institutions in Brazil and abroad in studies of soil fertility, maize improvement, and biostatistics. During the past five years it has participated in the National Research Council (Washington) project for the preservation of indigenous strains of corn in the Americas.

The Government of Brazil, the Brazilian National Research Council, and the Brazilian Commission for the Improvement of Higher Education Personnel (CAPES) are all contributing funds for special projects at the Piracicaba college. For additional equipment, supplies, and teaching and research expenses during the next five years, the Foundation in 1957 appropriated \$300,000 to the University of São Paulo. The Foundation has made similar grants, now totaling almost \$500,000, since 1943.

#### CORNELL UNIVERSITY

#### NEW YORK STATE COLLEGE OF AGRICULTURE

Through many years Cornell University has developed excellent facilities for studies in plant physiology and has brought plant physiologists of national standing to the faculties of many departments in the College of Agriculture and other units of the university. With the partial support of an outright \$250,000 grant from The Rockefeller Foundation, the university now plans to strengthen the program in plant physiology still further by consolidating all work in the field under the direction of the College of Agriculture.

All teaching and research staff working exclusively or in part in plant physiology on the Cornell campus will be incorporated into a single research body. The general aims of the program are to focus the attention of faculty, students, and research workers on the basic problems of plant physiology, with particular reference to cell division and

growth, mineral nutrition, and metabolism; to pool resources of personnel and equipment; and to create an atmosphere in which free collaboration and joint research projects may develop without departmental limitations.

Cornell plant physiologists are in the Department of Botany, in five other departments, and in the Federal Plant, Soil, and Nutrition Laboratory. Important investigations in progress under the direction of these scientists include studies of nitrogen fixation by legumes, the mechanics of translocation in plants, the aseptic culture of plant embryos, the physiology of mineral nutrition, the control of flowering through photoperiodism and temperature effects, and the photosynthetic activities of selected fruit and field crops. In a number of other significant research projects staff members collaborate with scientists at other institutions in this country and abroad.

The College of Agriculture of Cornell University attracts students and scientists from many countries for advanced training and experience. Currently about 100 graduate students are majoring or minoring in plant physiology and an average of 40 a year are working toward a Ph.D. degree in this field.

#### RURAL UNIVERSITY OF THE STATE OF MINAS GERAIS

##### SCHOOL OF VETERINARY MEDICINE

Under the leadership of its director, Dr. Antonio Vieira Machado, the School of Veterinary Medicine of the Rural University of the State of Minas Gerais, Brazil, has made great strides in developing its physical facilities and in building a well trained staff of veterinary scientists. Its students receive both a thorough grounding in the veterinary sciences and research experience, and through its investigations the school has directly contributed to the

improvement of animal health in Brazil and the development of veterinary medicine in Latin America.

Housed since 1941 in state buildings on the outskirts of Belo Horizonte, the school expects to move within the next two years to permanent quarters in a new structure turned over to the State of Minas Gerais by the Brazilian government. To help the school purchase necessary research equipment and library materials, and add research assistants to its staff when its occupancy of the new building is assured, The Rockefeller Foundation appropriated \$200,000 in 1957. The funds, available through a five-year period, continue assistance to the Rural University which the Foundation has given since 1952.

UNIVERSITY OF NORTH CAROLINA  
INSTITUTE OF STATISTICS

In many instances plant and animal breeders have been hampered in the development of improved hybrid lines by the dearth of information about transmission of the plant and animal traits affected by multiple genetic factors. It is difficult to isolate these traits, known as quantitative characters, in the desired combinations and in predictable patterns.

The Institute of Statistics of the University of North Carolina, at the State College of Agriculture and Engineering in Raleigh, is studying the inheritance of quantitative characters by analyzing breeding experiments statistically. Through its current program the institute is making fundamental contributions to the science of plant genetics, broadening the bases for the genetic interpretation of empirical data on quantitative characters, developing new experimental approaches to problems of quantitative inheritance, and evaluating current breeding systems.

Since its establishment in 1943, the institute has grad-

ually extended its influence into a number of foreign countries, particularly in Latin America. Some of the research techniques it has elaborated are widely used in plant breeding programs elsewhere in this country and abroad. As one of its functions it also serves as a consulting center, receiving many foreign visitors and responding to many written requests for various types of advice and assistance.

Since 1943 the Rockefeller endowed General Education Board and The Rockefeller Foundation have appropriated more than \$780,000 to the University of North Carolina toward support of the Institute of Statistics. The Foundation in 1957 renewed its assistance for institute research in mathematical and experimental genetics with a seven-year grant of \$195,000.

#### NATIONAL INSTITUTE OF GENETICS

##### RESEARCH ON RICE

Although understanding of the origin of cultivated crop plants is of great value to plant breeding programs concerned with the development of more productive varieties resistant to diseases, insects, and other hazards, the origin of cultivated rice, the leading food crop of Asia, has not as yet been thoroughly investigated.

To increase knowledge of the origin of rice and of the relationships between the various species or ecotypes, the National Institute of Genetics, Misima, Japan, has instituted a long-term research project under the leadership of Dr. Hideo Kihara, its director. Using modern genetic techniques developed and perfected in over 25 years of research on the origin of wheat, Dr. Kihara and his colleagues will study the wild species, *Oryza sativa spontanea*, which is widely distributed over Southeast Asia, to determine how present cultivated varieties may have developed

from this supposed ancestor. At least ten other *Oryza* species will be included in the research, and materials will be collected in other countries of Southeast Asia and the Far East and maintained for study at both the institute and cooperating institutions in other countries. The project will involve research on such morphological and physiological characteristics as response to day length in wild and cultivated rice strains and differences in resistance to fungus diseases and insect pests, as well as cytogenetic research on the degree of relationship between the various wild species and cultivated types.

In support of the rice research project, The Rockefeller Foundation in 1957 made a five-year grant of \$125,000 to the National Institute of Genetics.

TECHNOLOGICAL INSTITUTE AND SCHOOL OF  
ADVANCED STUDIES OF MONTERREY

SCHOOL OF AGRICULTURE

In the ten years since its organization by Mexican industrialists and agriculturists, the School of Agriculture of the Technological Institute and School of Advanced Studies of Monterrey has become one of Mexico's leading agricultural colleges. Under the energetic leadership of its young director, Ing. Leonel Robles Gutiérrez, the school has developed a complete curriculum, patterned after those followed in the land-grant colleges of the United States, as well as an active research program.

Students at the Monterrey school are given both theoretical training in the agricultural sciences and practical experience in farming and in modern experimental techniques at a large experiment station near Monterrey. The station provides excellent research facilities for both faculty and students, and its seed multiplication plots and poultry

plant help make it self-supporting. The school's graduates, many of whom subsequently receive advanced training with The Rockefeller Foundation Mexican Agricultural Program, are in great demand in Mexican agriculture.

The Foundation has contributed toward support of the School of Agriculture of the Technological Institute since 1949. A new grant of \$102,000 will continue Foundation assistance through the next three years.

#### SWEDISH SEED ASSOCIATION

##### PLANT PATHOLOGY

The Swedish Seed Association in Svalöf was organized more than fifty years ago for the purpose of developing modern methods to improve the seed of important Swedish farm crops. Originally a private cooperative organization, it is today the official Swedish institution for plant breeding and an important international research center. It cooperates with most of the other agricultural institutions in Sweden and with a number abroad, and attracts visiting scientists from many other countries.

In its efforts to achieve long-range plant improvement, the association has concentrated in the past on breeding for field resistance. More recently, it has placed increasing emphasis on the development of resistant varieties and effective control methods against the diseases of wheat, legumes, potatoes, and other vegetables and, in this connection, has instituted studies of the several hosts and pathogens and their relationships.

To help support the fundamental ecologic, pathogenic, and genetic studies of important plant diseases at the Swedish Seed Association, The Rockefeller Foundation has appropriated 300,000 Swedish crowns (about \$58,200), available over a two-year period.

**UNIVERSITY OF MINNESOTA****CORN AND BARLEY BREEDING**

The factors governing heredity in certain varieties of the evening primrose (*Oenothera*) are simplified because some of the chromosomes in the germ cells unite or link into "rings" which carry stable combinations of hereditary characteristics even when the chromosomes of two cells unite in fertilization. Knowing the factors governed by the "translocated" chromosomes, the geneticist or plant breeder can more easily select among the hereditary factors, in confidence that the desired characteristics will breed true.

If a similar mechanism of chromosome rings could be induced to occur in economically important plants such as corn or barley, the work of the plant breeder might be significantly facilitated.

A research project designed to create stocks of corn and barley seed with translocated chromosomes has been begun at the University of Minnesota under the direction of Dr. C. R. Burnham of the Department of Plant Genetics and Agronomy. To aid it, The Rockefeller Foundation in 1957 made a five-year grant of \$55,000.

**MINISTRY OF AGRICULTURE OF CHILE****LIBRARY DEVELOPMENT**

The Ministry of Agriculture of Chile will soon group its various research sections together at a new site near the city of Santiago. Part of the plan calls for the consolidation of the ministry's scattered libraries in one central building.

The Chilean government has allocated funds to build and furnish the library and has also established a budget for regular maintenance and the continuing acquisition of library materials. For completion of the collections to be

installed in the new building, for some of the initial organization costs, and for the training of library personnel, the Foundation has made a three-year grant of \$55,000 to the Ministry of Agriculture.

UNIVERSITY OF ILLINOIS

RESEARCH IN ENTOMOLOGY

For a number of years Professor G. S. Fraenkel and his group at the University of Illinois, Urbana, have studied the causes underlying the distinct preferences in food sources shown by leaf-feeding insects, as well as the manner in which they utilize plant food in different stages of maturity. Of great practical importance to the development of successful measures for insect pest control, the studies have so far shown that host specificity in insects might be explained as a sensory reaction to such compounds as glucosides, alkaloids, and essential oils.

Using the information obtained in this earlier research, Dr. Fraenkel and his colleagues will attempt to isolate and identify the attractant substances and to demonstrate their presence in other plants of the insects' choice. They will try to ascertain the role of repellents in the insect-host plant relationship in insects of economic importance, investigate the adaptation of insects to new host plants, and study the sensory mechanism involved in the recognition of the host plant. Toward the costs of their research program The Rockefeller Foundation has contributed \$50,000, available over a five-year period.

BOYCE THOMPSON INSTITUTE FOR  
PLANT RESEARCH, INC.

STUDY OF ECONOMICALLY IMPORTANT PARASITES

A number of the more serious diseases of plants are caused by fungi, known as obligate parasites, which cannot

be cultured apart from their hosts. Control measures for this group of pathogens, which includes the rusts of cereals and many grasses, the powdery mildews of fruits and vegetables, and some of the downy mildews, are limited at present to the breeding of resistant varieties of the crop plants and to the external application of fungicidal chemicals.

Plant pathologists are exploring the possibility of controlling obligate parasites by applying fungicides to the plant host which will enter into the plant cells themselves and protect the plant during critical periods of its life cycle. They will not be able to go much beyond an empirical level in these investigations of systemic fungicides, however, until they are able to study the fungi in isolation.

The Boyce Thompson Institute for Plant Research, Inc., Yonkers, New York, has undertaken a program of fundamental research on the biochemical relationships between obligate parasites and their hosts, in search of information that may enable plant pathologists to maintain the pathogens in pure culture and study their metabolic processes. Toward the costs of the project the Foundation has made a three-year grant of \$45,000.

#### IOWA STATE COLLEGE

#### PLANT SCIENCE

It has been estimated that plant pests and diseases together destroy as much as 15 to 25 per cent of food and other crops annually. Although chemical control is widely used to reduce this percentage, it is less effective, and less economical, than control of damage through the development of disease- and pest-resistant varieties. Because of the complex biological and chemical analyses involved, however, too little is known about the nature of insect resistance in plants.

To increase understanding of the biochemical and other factors involved in the host-parasite relationship, a group of investigators—including geneticists, biochemists, and entomologists—at the Iowa State College have planned a joint research project on the chemical bases of resistance to insects that attack corn, with particular attention to the factors conditioning resistance to the European corn borer. The group have already developed a number of lines of corn resistant to the borer, and perfected techniques for rearing corn borer larvae in artificial media to make possible continuous experimentation throughout the coming years. To strengthen the project through the addition of a research biochemist and technical assistants in biochemistry and entomology, the Foundation in 1957 appropriated \$45,000 to be used by the Iowa State College, Ames, during a three-year period.

LOUISIANA STATE UNIVERSITY

DEPARTMENT OF AGRONOMY

In several countries where rice is the main food crop, crosses of principal geographic races are being investigated in an effort to combine yielding qualities, strength of straw, and other favorable characteristics. This breeding work has been handicapped by a lack of basic research in rice genetics and cytogenetics.

As part of a long-term effort to improve the yielding capacity and quality of the crop, the Louisiana State University is conducting studies on genetic and cytogenetic relationships in rice. The research will attempt to determine chromosome homology and fertility of intervarietal crosses, and to obtain hybrids from wild species. A three-year grant of \$45,000 has been made by The Rockefeller Foundation in support of the research.

**UNIVERSITY OF CHIHUAHUA****ANIMAL SCIENCE**

The University of Chihuahua, founded two years ago, is located in the center of the Mexican livestock industry. Through the joint efforts of the State Governor, university officials, and the Livestock Union of Chihuahua, the university has established a School of Animal Husbandry in response to the demand for well-trained animal husbandmen.

The school is the first educational institution to be established in Mexico for training and research exclusively in the field of animal husbandry. Plans have been made to establish a range-management experiment station, and for the development of a three- to four-year curriculum in animal husbandry. The federal Ministry of Agriculture is also providing support for the school, and members of The Rockefeller Foundation's staff in Mexico City will be available for consultation on technical problems.

To assist in the school's development, The Rockefeller Foundation appropriated \$40,000 to the University of Chihuahua for use during the next three years.

**FOREST RESEARCH INSTITUTE OF SWEDEN****DEPARTMENT OF GENETICS**

Since the organization in 1902 of the Forest Research Institute of Sweden, its Department of Genetics has become one of the leading international centers for research in mutation genetics. The department's studies are not confined wholly to the improvement of forest tree species, but include researches on barley and other crops of economic importance. Projects currently in progress include X-ray seed analysis, research on the cytogenetics of economic tree species and cereals, electron microscopic studies of the

origin, structure, and development of chloroplasts, and irradiation studies using X rays, activated cobalt, and phosphorus as mutagenic agents.

The addition of a phytotron to its research facilities would enable the department to grow experimental plant materials under controlled climatic conditions, eliminating the effect of ecologic variations on the interpretation of results. Toward the costs of equipment for a phytotron which will be built during the next two years with funds from Swedish sources, The Rockefeller Foundation has appropriated 200,000 Swedish crowns (about \$38,800) to the Forest Research Institute, Stockholm.

#### UNIVERSITY OF WISCONSIN

##### PLANT SCIENCE

For more than two decades Professor Perry W. Wilson and his associates at the University of Wisconsin have been studying the unique capacity of certain plants, especially bacteria, to fix atmospheric nitrogen. One of the most vital elements affecting agricultural production, biological nitrogen fixation is a process of utmost importance for satisfactory plant growth.

Recent research has established many important facts about the nature of the process itself and the role biological agents play in nitrogen fixation. Professor Wilson and his co-workers are now planning to concentrate upon the intermediate steps in the transformation of elemental nitrogen to ammonia, an end product of the reaction, as well as to continue their survey of biological agents capable of fixing nitrogen.

A new five-year grant of \$37,500 to the University of Wisconsin will continue Foundation assistance begun in 1940 for this research.

**ROYAL COLLEGE OF AGRICULTURE****INSTITUTE OF GENETICS**

The Institute of Genetics of the Royal College of Agriculture, Uppsala, one of Sweden's 18 research institutes for agricultural education and research, was founded in 1955 under the direction of Dr. Axel Nygren. A cooperative arrangement under which Professor Nygren is also responsible for undergraduate and advanced training in plant genetics at the University of Uppsala has fostered the development of research collaboration between the college's Institute of Genetics and the university's Institutes of Human Genetics and Biochemistry.

In the course of their research on the biochemical and physiological aspects of plant genetics, Professor Nygren and his associates have developed methods of investigating the basic mechanisms related to ecotype differentiation in higher plants. In the next few years they plan to expand their studies of the physiological and biochemical characteristics of hereditary variation within and between ecotypes in the hope of gaining understanding of the selective advantage of the different characteristics and of the potential ability of adaptation within a well defined genetic background. A Rockefeller Foundation grant of 180,000 Swedish crowns (about \$35,000) to the Royal College of Agriculture will aid these researches during the next five years.

**UNIVERSITY OF ILLINOIS****PLANT SCIENCE**

Although certain species of crop plants are more productive as polyploids—organisms with more than two sets of the basic number of chromosomes—the high degree of sterility found in polyploids has limited their usefulness in plant breeding programs.

For some years Dr. M. M. Rhoades and Dr. D. E. Alexander of the University of Illinois have conducted research on the causes of sterility in tetraploid maize. Already they have surmounted the difficulty of breeding large numbers of tetraploids in maize, and are now in a position to produce synthetic tetraploid varieties of great genetic diversity. Their research efforts during the next few years will be directed toward determining the usefulness of these tetraploid hybrids in increasing the productivity and vigor of maize and other economic crops.

Toward support of the research carried on by Dr. Rhoades and Dr. Alexander, the Foundation in 1957 appropriated \$34,000 to the University of Illinois, Urbana.

TEXAS AGRICULTURAL AND MECHANICAL COLLEGE  
SYSTEM

PLANT SCIENCE

In the past decade the development in the United States of the technology of rice production has attracted attention from all of those countries in the world in which rice is a major food crop. An increasing number of foreign agricultural scientists have been coming to the principal rice-producing states—Texas, Louisiana, Arkansas, and California—to study rice improvement, production, and management.

During the past two years the Texas Agricultural and Mechanical College System has received approximately 100 foreign visitors from 21 countries at its Rice Pasture Experiment Station at Beaumont. In recognition of its international responsibilities, the college system established in 1956 a formal program for training foreign students in rice technology. Field and laboratory facilities at the Beaumont station and at the main campus in College Station are being made available to the foreign scientists as well as the

services of the college's technical specialists who will aid in their training.

As a contribution toward the costs of the program, The Rockefeller Foundation made a three-year grant of \$30,000 to the Texas Agricultural and Mechanical College System.

#### UNIVERSITY OF THE PHILIPPINES

##### COLLEGE OF AGRICULTURE

Along with the impressive postwar increase in native enrollment at the College of Agriculture of the University of the Philippines there has been a rapid rise in the number of students from neighboring countries who come to the school at Los Baños for training. To provide living accommodations, as well as social and recreational facilities for foreign students, the university in 1956 drew up plans for a new dormitory which will also include space for a limited number of Filipino students and for visiting scientists.

To help the university meet construction costs, The Rockefeller Foundation contributed \$250,000 in 1956, and in 1957 an additional \$30,000, for use during the period ending December 31, 1960.

#### INTER-AMERICAN SOCIETY OF PLANT BREEDERS, PLANT PATHOLOGISTS, ENTOMOLOGISTS, AND SOIL SCIENTISTS

Since 1949 the Inter-American Society of Plant Breeders, Plant Pathologists, Entomologists, and Soil Scientists has held three symposia which have brought together agricultural scientists from most of the countries of Latin America and from the United States for the exchange of information and ideas and the planning of future cooperative research projects. The delegates participated in round-table

discussions, field trips, and formal sessions at which papers were presented on topics in plant breeding, plant pathology, entomology, and soil improvement. The meetings served to point up the value of coordinated and concentrated efforts for crop improvement, and to throw light on what the participating scientists might accomplish in agricultural research under their local conditions.

At the invitation of the Chilean government, the society will hold a fourth such meeting in Santiago during 1958 with financial support from a Rockefeller Foundation grant of \$25,000.

#### UNIVERSITY OF SAN MARCOS

##### ANIMAL SCIENCE

During its 11-year history as part of the 406-year-old University of San Marcos, Lima, Peru, the Faculty of Veterinary Medicine has grown into one of the leading schools of its kind in Latin America. Under the leadership of its former dean, Dr. José Santiváñez M., and of its present dean, Dr. Teodoro Ramos Saco, the faculty has built up an excellent staff and has developed a curriculum of broad professional training. The cattle production industry of the country is served not only through the faculty's research and training of a corps of skilled veterinarians, but also through its contacts with both official and private organizations.

Two new Rockefeller Foundation grants will be used by the Faculty of Veterinary Medicine over a three-year period, together with funds from two previous grants, to expand its teaching and research facilities. One appropriation will provide 440,820 Peruvian soles (about \$23,300) to help improve teaching by enabling the faculty to place an increased number of staff members on a full-time basis.

The second grant, for \$15,000, will be used for research expenses and equipment and supplies.

#### AGRICULTURAL RESEARCH IN JAPAN

To assist a variety of research projects directed toward the solution of some of the specific problems affecting Japanese agriculture, The Rockefeller Foundation made ten small grants totaling \$224,500 during 1957.

Three of the grants went to institutions on Hokkaido, the northernmost and least densely populated of the Japanese islands. Although rice is grown on Hokkaido, the island's cold climate and hilly, rolling terrain are more favorable to other agricultural enterprises of which perhaps the most important is dairy husbandry. To support studies of management practices and of forage and pasture crops for Hokkaido's dairy farms, the Foundation appropriated \$25,000 to Obihiro Zootechnical University. Obihiro faculty members will use as many as 600 of the island's dairy farms in their studies of management systems, soil management, animal breeding, and marketing practices, and will investigate the adaptability of various forage crop species and varieties to Hokkaido's terrain and climate.

Because Hokkaido produces more food than can be consumed on the island, but is remote from large population centers, the problems of food preservation, both in storage and transport, are of considerable importance. Scientists at Hokkaido University, Sapporo, will use a \$23,000 grant to support integrated studies of food preservation, the microbial decomposition of food, and food analysis, in efforts to solve some of these problems. The Foundation's grant will also partially finance studies of the stunt disease of rice, caused by a virus, which is widespread on the island and which is responsible for heavy annual losses in the rice crop. In an attempt to devise appropriate control measures

the Hokkaido University investigators are emphasizing research on the physical and chemical properties of the virus.

A third grant of \$15,000 will assist the Hokkaido National Agricultural Experiment Station, Sapporo, in the purchase of equipment. The station staff is concerned primarily with the problems raised by Hokkaido's diversified agriculture, and has developed excellent programs in potato testing, breeding, and disease control, in cereal breeding, animal husbandry, and the reclamation and management of peat soils.

Researchers at Tohoku University in Sendai, on the island of Honshu, are interested in finding more effective ways to use the upland areas unsuitable for rice cultivation. Because rice is the mainstay of the national diet, studies of other crops and of land unfavorable for rice cultivation have been relatively neglected. Postwar food shortages have, however, called attention to the need for utilizing all available arable land. Tohoku's Faculty of Agriculture is conducting experiments to determine which economic crops grow well in the uplands, how best to manage these irregular terrains, what forage and pasture crops to plant in support of animal husbandry, and how the milk and meat production of domestic animals can be improved. A Foundation grant of \$40,000 will help finance these studies over a three-year period.

Two grants were made to universities in Tokyo to assist a number of research projects relevant to Japan's food supply problems. The Tokyo University of Education received \$30,000 toward the costs of studies of the distribution and importance of cereal rust fungi in Japan and nearby islands, the breeding of hardy forage crops for production in rice paddies during the winter months, the utilization of wood sugars by microorganisms, and the preservation of foods by gamma ray irradiation.

Tokyo University received \$30,000 for the purchase of equipment needed for research on plant and animal viruses, genetics, enzymology, agricultural biochemistry, and insect physiology. Tokyo's Faculty of Agriculture has long been known for its emphasis on basic research, and under its curriculum offers studies in forestry, fisheries, and veterinary science as well as in the strictly agricultural sciences. Founded in 1880, the Faculty of Agriculture is today one of Japan's largest, with a staff of 100 and a student body of approximately 500.

Okayama University, located in the southern part of Honshu, received two grants during 1957. One of \$14,500 will be used by the Faculty of Agriculture for the purchase of an infrared spectrophotometer needed for study of the nature and chemical associations of flavors in milk, identification of toxic substances in one of Japan's principal food fishes, and research on certain plant growth substances and their synthesis.

The second grant to Okayama University will provide \$15,000 over a two-year period toward support of research at the Ohara Institute for Agricultural Biology in Kurashiki. The funds will help support studies in plant breeding, mycology, entomology, plant physiology, and agricultural chemistry, as well as a research project on the chemical composition of river waters. Because of the relationship between the composition of river water and the fertility of rice paddies flooded by rivers, the project is of great importance to Japan and other rice-producing countries.

The Faculty of Agriculture of Kyushu University, Fukuoka, is particularly noted for its research on the biochemistry of plant and animal viruses with reference to plant and animal production, the fractionation of essential proteins, the isolation and study of bacteriophage, the purification of enzymes, and the preservation of foodstuffs. A

Foundation grant of \$15,000 will be used to purchase equipment needed in these studies.

The final grant is one of \$17,000 to Kagoshima University, also on the island of Kyushu, where important ecological studies of basic agricultural crops for winter production are under way. In order to obtain more precise ecologic data, the faculty wishes to establish controlled temperature and humidity chambers in which crop plants can be tested in terms of their growth requirements. Foundation funds will help provide this needed equipment, as well as reference books and periodicals for the university library.

#### OTHER GRANTS

University of London, Wye College, England: equipment for research on the biochemistry of growth-regulating compounds in the Plant Growth Substance and Systemic Fungicide Unit, under the direction of Professor Ralph L. Wain; \$16,000;

Inter-American Institute of Agricultural Sciences, Turrialba, Costa Rica:

Cooperative research in horticulture by the institute and The Rockefeller Foundation Mexican Agricultural Program; \$13,250;

A preliminary study for the establishment of a research center for temperate zone agriculture; \$7,750;

Support of the corn improvement program; \$7,500;

International travel expenses of deans of Latin American agricultural schools attending a meeting in Santiago, Chile, on agricultural higher education; \$5,000;

Ing. Enrique Blair, Andean Zone Training Center, Lima, Peru; to visit institutions in the United States to observe research and practice in irrigation and water use; \$1,850;

National University of Colombia, Bogotá: equipment for the dormitory of the Faculty of Agronomy at Palmira; \$11,450;

Auckland Institute and Museum, New Zealand: research on the genetics, morphology, and ecology of taros and kumaras; \$10,000;

Kiyosato Educational Experiment Project in Japan, Inc.: professional guidance, agricultural equipment, and supplies; \$10,000;

Mexican Institute of Natural Renewable Resources, Mexico City: arid lands research in northeastern Mexico; \$10,000;

Ministry of Education, Lagos, Nigeria: scholarships in the fields of agriculture, forestry, and veterinary medicine; \$10,000;

National School of Agriculture, Barcena, Guatemala: laboratory, classroom, and library equipment and supplies; \$10,000;

State Secretariat of Agriculture, São Paulo, Brazil:

Library equipment and supplies for the Institute of Agronomy; \$10,000;

Equipment for research in plant physiology in the Institute of Biology; \$10,000;

Ernesto Manoel Zink, chief librarian, Institute of Agronomy; to visit libraries in the United States and Puerto Rico; \$2,550;

Tohoku Agricultural Experiment Station, Morioka, Japan:

Laboratory equipment and supplies; \$10,000;

Laboratory equipment and books for the Horticultural Division; \$9,000;

University of Arizona, Tucson: development of the program of collaboration with the University of Sonora, Hermosillo, Mexico; \$10,000;

University of Reading, England:

Laboratory equipment for the National Institute for Research in Dairying, Shinfield; \$10,000;

Equipment for use in the Physiology Department, National Institute for Research in Dairying, Shinfield; \$10,000;

University of San Carlos, Guatemala City, Guatemala: equipment and library materials for the Faculty of Agronomy; \$10,000;

University of San Simón, Cochabamba, Bolivia: research in plant breeding, by Dr. Martín Cárdenas, Faculty of Agriculture; \$10,000;

Yamaguchi University, Japan: books and journals for the library of the Faculty of Agriculture; \$10,000;

Macaulay Institute for Soil Research, Craigiebuckler, Aberdeen, Scotland: spectrochemical equipment; \$9,500;

Ministry of Agriculture and Forestry, Tokyo, Japan:

Equipment for research in home economics in the Home Improvement Section; \$9,000;

Publication by the Research Division of an English version of the generalized soil map of Japan; \$2,220;

University of Caldas, Manizales, Colombia: a greenhouse for the Faculty of Agronomy; \$9,000;

University of Florida, Gainesville: study of tropical soils under conditions of shifting cultivation, by Dr. Hugh Popenoe; \$9,000;

Iowa State College, Ames: toward the expenses of prominent German scientists invited to the college for teaching and research; \$8,600;

University of Concepción, Chile: equipment, supplies, and books for the Faculty of Agronomy library at Chillán; \$8,000;

Uttar Pradesh Government Horticultural Research Station, Saharanpur, India: to invite Dr. R. M. Smock, professor of pomology, Cornell University, Ithaca, New York, to direct research on cold storage of tropical fruits; \$7,200;

University of the Philippines, Quezon City: toward expenses of the First Southeast Asia Soil Science Conference, to be arranged by the Soil Science Society of the Philippines; \$7,000;

University of California:

*At Davis:*

Dr. R. H. Vaughn, Department of Food Technology, and Mrs. Vaughn; to serve as consultant to the Institute of Microbiology, Luiz de Queiroz College of Agriculture, Piracicaba, Brazil, in

connection with research on food technology as applied to agriculture; \$6,600;

*At Berkeley:*

Chemical analysis of soil samples in the laboratory of Dr. Hans Jenny, professor of soil chemistry and morphology; \$2,500;

University of Maine, Orono: research in helminthology, by Dr. Gordon E. Gates; \$6,500;

William J. S. Sloan, director of agriculture, Department of Agriculture and Stock of the State of Queensland, Brisbane, Australia: to visit agricultural education, research, and extension centers in the United States; \$5,150;

Cooperative Program for Agriculture and Cattle Experimentation, Ministry of Agriculture, Lima, Peru: development of a bean improvement program at the La Molina agricultural experiment station; \$5,000;

Kyoto University, Japan: equipment and supplies for the Department of Biochemistry, College of Agriculture; \$5,000;

National University of Mexico, Mexico City:

Development of a program of applied mycology and of a mycological herbarium in the Institute of Biology; \$5,000;

Dr. Manuel H. Sarvide Arguelles, professor of pathology, School of Veterinary Medicine and Animal Husbandry; to visit veterinary science faculties and research institutions in Latin America and the United States; \$2,800;

State College of Washington, Pullman: development by the Department of Agronomy of an experimental machine for the preparation of plot lands and a combination planter for field crop experiments; \$5,000;

Noboru Takase, plant breeder and plant pathologist, Hokkaido Agricultural Experiment Station, Sapporo, Japan: to visit agricultural research centers in North America and Europe; \$4,050;

Food and Agriculture Department, Madras Province, Coimbatore, India:

Dr. K. C. Naik, joint director for coordination of research, and principal, Coimbatore Agricultural College and Research Institute; to visit land-grant colleges and other agricultural centers in the United States; \$4,010;

P. P. I. Vaidyanathan, secretary; to visit land-grant colleges and other agricultural centers in the United States; \$4,010;

Dr. Feliks Stanski, dean, Department of General Pathology, Veterinary Faculty, Agricultural College, Lublin, Poland: to visit research centers in the United States; \$4,000;

Dr. Hiko-Ichi Oka, head, Department of Physiological Genetics, National Institute of Genetics, Misima, Japan: to visit agricultural research centers in the United States and the Philippines; \$3,900;

University of San Marcos, Faculty of Veterinary Medicine, Lima, Peru:

Dr. Manuel Moro Sommo, principal professor of bacteriology and virology; to visit centers of veterinary research in the United States; \$3,600;

Dr. Teodoro Ramos Saco, dean; to visit veterinary research centers in Mexico, Canada, and the United States; \$2,780;

University of Pavia, Italy: research expenses of a corn breeding project at the Genetics Center; 2,085,000 Italian lire (about \$3,500);

Dr. Naoki Hatai, Division of Entomology, National Institute of Agricultural Sciences, Tokyo, Japan: to visit universities in the United States; \$3,450;

Abdul Jabbar Al-Bakr, director-general of agriculture, Ministry of Agriculture, Baghdad, Iraq: to visit The Rockefeller Foundation Mexican Agricultural Program and agricultural institutions in the United States; \$3,270;

Dr. Stefan Barbacki, Institute of Plant Breeding, Polish Academy of Sciences, Poznan: to visit universities in the United States and Canada; \$3,150;

Dr. Troy M. Currence, Department of Horticulture, University of Minnesota, St. Paul, and Mrs. Currence: to study vegetable crops in Mexico; \$3,100;

National Agricultural Experiment Station, Sacavém, Portugal: laboratory equipment; \$3,000;

National Agricultural Research Service, Rio de Janeiro, Brazil: equipment for research at the Institute of Ecology and Agricultural Experimentation, by Dr. José Paixao; \$3,000;

Dr. Jan M. Kielanowski, director, Institute of Animal Physiology and Nutrition, Polish Academy of Sciences, Bydgoszcz: to visit agricultural research and education centers in the United States and England; \$2,950;

Ing. Héctor Wulf Marquez, head, milling and baking laboratory, Department of Agricultural Production, Ministry of Agriculture, Santiago, Chile: to study in the United States and to visit laboratories in Mexico, Colombia, and Peru; \$2,865;

Tadeusz Zeligowski, Central Agricultural Library of Warsaw, Poland: to visit libraries in the United States; \$2,850;

Central College of Agriculture, Warsaw, Poland:

Dr. Eugeniusz Domanski, Veterinary Faculty; to visit research centers in England and the United States; \$2,650;

Dr. Franciszek Abgarowicz, head, Department of Animal Nutrition; to visit agricultural institutes and experiment stations in Switzerland; \$1,750;

Dr. Jerzy Czosnowski, head, Department of Plant Physiology, University of Poznan, Poland: to visit research centers in the United States; \$2,650;

Dr. Wladyslaw Wegorek, director, Plant Protection Institute, Poznan, Poland: to visit research centers in the United States; \$2,250;

Dr. Wladyslawa Dabrowska, Department of Experimental Biology, Institute of Animal Breeding, Pulawy, Poland: to visit research centers in the United States and Canada; \$2,225;

Ministry of Agriculture, Mexico City, Mexico:

Juan Zamora Lopez, Agricultural Extension Service; to study in the United States; \$2,100;

Ing. Carlos Tapia, extension specialist, Office of Special Studies; to visit agricultural research centers in the United States; \$1,650;

Ing. José Rodriguez Gedovius, General Agricultural Division; to attend a seed improvement training course in the United States; \$1,645;

Ing. Juan Salazar, General Agricultural Division; to attend a seed improvement training course in the United States; \$1,645;

Agricultural University of Warsaw, Poland:

Dr. Roman Hoppe, chairman, Department of Veterinary Obstetrics and Pathology; to visit veterinary schools in Europe; \$1,775;

Dr. Jozef Kochman, professor, Department of Plant Pathology; to visit the Federal Technical Institute, Zurich, Switzerland; \$1,750;

Ing. Gerardo Naranjo M., dean, Faculties of Agronomy and Veterinary Medicine, Central University of Ecuador, Quito: to visit land-grant colleges in the United States and The Rockefeller Foundation Mexican and Colombian Agricultural Programs; \$1,730;

University of Alaska, Alaska Agricultural Experiment Station, Palmer: to invite Dr. J. G. Dickson, professor of plant pathology, University of Wisconsin, Madison, to assist with studies of forage crop diseases; \$1,600;

Professor Mário Paulo Autuori, Biological Institute, São Paulo, Brazil: to visit research centers in Europe; \$1,450;

National School of Agriculture, Chapingo, Mexico:

Mrs. Czeslawa Prywer, professor of botany; to visit agricultural research centers in the United States; \$1,300;

Jesús Muñoz Vazquez, director; to visit graduate schools of agriculture in the United States; \$610;

Eliseu Maciel School of Agronomy, Pelotas, Brazil: laboratory equipment; \$1,200;

Dr. Theodosius Dobzhansky, professor of zoology, Columbia University, New York: to visit Colombia and Ecuador to collect representative materials from the varied populations of *Drosophila paulistorum*; \$1,000;

Rector and Mrs. Juan Gomez Millas, University of Chile, Santiago: to visit agricultural education and research centers in Puerto Rico and the United States; \$1,000;

Ohio State University, Columbus: continued research on insect acoustics by the Department of Zoology and Entomology of the College of Agriculture; \$1,000;

Dr. Lloyd H. P. Jones, senior research officer, Division of Plant Industry, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia: to visit soil science research centers in the United States; \$900;

Ing. Antonio Garcia, special assistant to the director, Inter-American Cooperative Agricultural Service, Quito, Ecuador: to visit land-grant colleges in the United States and The Rockefeller Foundation Mexican and Colombian Agricultural Programs; \$725;

Dr. Robert E. Karper, agronomist, Department of Sorghum Investigations, Texas Agricultural Experiment Station, Lubbock: to visit The Rockefeller Foundation Mexican Agricultural Program; \$590;

John R. Quinby, superintendent, Agricultural Substation, Chillicothe, Texas: to visit The Rockefeller Foundation Mexican Agricultural Program; \$590;

Dr. Hugh C. Thorpe, senior research officer in plant breeding, Department of Agriculture, Nairobi, Kenya: additional expenses of visits to research centers in Mexico and the United States; \$225;

Fund for grants of amounts not exceeding \$500 for allocation under the supervision of the Foundation's Director for Agriculture; \$5,000;

Additional costs of publication of a thirteen-year review of the agricultural program of The Rockefeller Foundation; \$2,500.

## Operating Programs

For this report, see pages 45-55 of The President's Review.

## Grants with Long-Range Relation to World's Food Supply

### NATIONAL PHYSICAL LABORATORY

#### RESEARCH ON SOLAR ENERGY

Israel, by virtue of necessity and geographical location, is keenly interested in the utilization of solar energy as a fuel source, and has charged the National Physical Laboratory directed by Dr. H. Tabor with the primary responsibility for studying techniques to harness this free energy so abundant during most of the year.

The development of a greatly improved coating for solar collectors is one of the major achievements of Dr. Tabor and his colleagues at the laboratory. Although further research must be done on heat storage and fuel cells, this demonstration of a workable selective surface makes possible the construction of solar collectors operating at higher temperatures. During the next few years Dr. Tabor intends to expand these studies; he will also conduct studies of large-area solar collectors using other methods to trap the incident energy.

Because photoelectric and photochemical systems hold even greater promise for the exploitation of solar energy than does the thermal, Dr. Tabor plans also to extend his preliminary studies in these fields. The research results to date indicate that new materials might be developed for the direct conversion of solar energy to electricity that would be substantially cheaper than the substances currently used.

The National Physical Laboratory, Jerusalem, has received a \$50,000 grant from The Rockefeller Foundation toward support of its solar energy research program during the next three years.

## UNIVERSITY OF LONDON

## IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY

The science of cloud physics, on which such practical applications as induced rainfall, among others, must rest, is itself limited by gaps in knowledge concerning water. Dr. B. J. Mason, an internationally known authority on cloud physics, recognized this fact and three years ago organized a research group to study the structure and the physical and chemical properties of water. The group, under Dr. Mason's leadership at the Imperial College of Science and Technology, University of London, have since made a number of important contributions to better understanding of water in its three natural states, as liquid, vapor, and ice.

Among the accomplishments of the Imperial College group are the discovery of a new cubic form of ice crystals, establishment of the relationships between droplet volume, rate of cooling, and temperature of freezing, and the removal, through restudy of the compounds used for cloud seeding, of many anomalies in reported artificial rainfall experiments. In the next few years the group will give major attention to further study of crystal formation, partly because the coexistence of ice crystals and super-cooled water droplets is often the critical state preceding natural rainfall.

The Foundation, which aided the initiation of the studies in 1954, has made a new grant of £10,000 (about \$28,500) toward their support during the next five years.

## OTHER GRANTS

Rothamsted Experimental Station, Harpenden, England: research equipment and supplies; £2,000 (about \$5,700);

Dr. Masayoshi Hatanaka, Faculty of Agriculture, Tohoku University, Sendai, Japan: to visit scientific institutions in the United States and Canada; \$3,550;

Professor Yasuo Suyehiro, Fisheries Department, Tokyo University, Japan: to visit research institutions in the United States; \$3,350.



## **The Social Sciences**

THE SOCIAL SCIENCES

*Major Interests, 1957*

The Social Sciences as Scientific Disciplines ..	\$ 602,055
The Quest for Economic Development .....	1,079,720
Problems of Contemporary Western Society .	375,000
Legal and Political Philosophy .....	513,750
Fellowships .....	500,000
Grants in Aid .....	500,000

# THE SOCIAL SCIENCES

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**A**S DESCRIBED IN the two preceding Annual Reports, the areas of program emphasis in the social sciences are essentially three. The first is basic, theoretical work in the social science disciplines that promises to open up new directions for thought or to synthesize usefully different lines of inquiry. A case in point here is the special program in legal and political philosophy, under which for the past several years the officers, with the valued counsel of a distinguished advisory committee, have endeavored to assist younger scholars in this general field by modest grants that permit them individually to follow up fruitful subjects of inquiry and speculation.

**A second program emphasis is on assistance to research efforts on some of the major problems confronting contemporary society, particularly those that have more than local or national interest and that can possibly add something to the social sciences as scientific disciplines as well.** The third emphasis in the social sciences program is on modest contributions to the development of social scientists and social science research in those countries in Asia, the Middle East, and Latin America where frequently the social sciences are not yet well developed as a field of serious study and where their techniques are little utilized in the analysis of local and international problems.

The available resources for serious work in the social sciences are now vastly greater than they were in 1929 when the Foundation absorbed the social science program of the former Laura Spelman Rockefeller Memorial. Fellowships for foreign study are also more numerous than they were then. The Foundation program in the social sciences necessarily reflects these and the many other changes of the intervening years. Program emphases which were once appropriate are now surely inappropriate. It is about as true now as it was in 1929, however, that in the social as in other sciences there are far too few powerful and original minds that can genuinely advance matters. Thus the quest for truly superior persons to whom the Foundation might be modestly helpful is always a major point of program emphasis.

Though the social sciences are not in a sorry state, none the less they fall well short of what one would wish and what the times urgently require. To take but one important instance, the problems of economic development are economic, social, political, and international in character. Yet such analyses and theories of economic growth, social change, political evolution, and international relations as the social sciences have yet devised are too often much too simple as formal models or, alternatively, too dependent upon presuppositions that often do not hold for many areas of the world to be confidently applied to the concrete problems of development of a particular country. Yet the semblance of the way out surely lies in better work at home and abroad on these and related problems by trained social scientists with vigorous minds and a genius for cutting through to the heart of a problem.

Limited as the achievements of the social sciences admittedly are, they yet possess a corpus of knowledge and certain techniques of analysis which are, ostensibly, applicable to many problems that the underdeveloped, the "new"

countries can only solve in their own way for themselves. To do so, however, these countries need trained social scientists and their own centers of research and training in the social sciences.

## The Social Sciences as Scientific Disciplines

JOHNS HOPKINS UNIVERSITY

SCHOOL OF ADVANCED INTERNATIONAL STUDIES

Many urgent problems in the field of international politics are of common interest and concern to the theorist and the practicing diplomat. For example, the task of creating, maintaining, and preserving the free world alliance is continuously before the policy-maker; at the same time, scholars are seeking to understand the factors that lead certain nations to form and subsequently to dissolve their ties.

In its efforts to find possible solutions to many such pressing problems in foreign policy, the School of Advanced International Studies of the Johns Hopkins University is inaugurating a new program to unite the discipline of the qualified scholar with the experience of the trained practitioner. Under the joint research effort, led by Professor Paul Nitze, authorities from the academic world and the field of practicing diplomacy will be invited to join with members of the school's staff in examining issues of mutual concern through both individual research and group discussion. In addition, most of the participants will offer graduate courses or seminars within the school's curriculum.

In support of the research program on the theory and practice of foreign policy, The Rockefeller Foundation in 1957 appropriated \$300,000 to the Johns Hopkins Uni-

versity, Baltimore, Maryland, for use during a seven-year period by the School of Advanced International Studies, Washington, D.C.

NATIONAL FOUNDATION OF POLITICAL SCIENCES

RESEARCH AND TRAINING

The Communist and National Socialist onslaughts on Europe, with their economic and ideological implications, have inevitably shaken the authority of the accepted forms of democracy, liberty, and political power. New concepts of government are evolving, and at the same time, as one French political theorist observed, "Europe is looking for standards and criteria that can help it differentiate between good and bad political ideas."

The National Foundation of Political Sciences, Paris, is one of a few training and research centers on the Continent devoted to bringing political theory to bear on pressing contemporary problems. Under the leadership of an extraordinarily able group of scholars, it now proposes to expand its program, in part by extending its contacts abroad and by awarding grants for research in France to outstanding scholars from Europe, Asia, and the Middle East.

The visitors will carry out individual investigations and will join in seminars and private discussions at the National Foundation with political theorists from the United States, France, and other countries. The entire group will work to develop more adequate ideas of the nature of international politics, drawing upon the historical experience of European nations; attempt to trace how foreign policy decisions are made in their respective countries; and seek to illuminate, by means of examples, the methods of modern diplomacy.

In support of these and related activities, The Rockefeller Foundation in 1957 made a five-year grant of 27,-

300,000 francs (approximately \$81,900) to the National Foundation.

## UNIVERSITY OF CAMBRIDGE

## DEPARTMENT OF APPLIED ECONOMICS

The comparatively new "input-output" method of economic analysis is the study of an economy through analysis of the "inputs"—commodities received by—and the outputs of its various sectors. The procedure of the method is to amass data on the existing levels of trade within the economy and then to collate this information in a double entry table which serves as a model of the economy showing the interdependency of its parts. The purpose of the model is to indicate what changes in input and output are associated with or are necessary to the stimulation or curtailment of production in any given sector.

A research group under the leadership of Professor J. R. N. Stone in the Department of Applied Economics at the University of Cambridge, England, is among the leading groups of investigators now working to perfect the input-output analytic method. In the first phase of a three-part study, Professor Stone and his colleagues assembled data on selected sectors of the economy of Great Britain and combined them in an input-output table. In the second phase the group will seek a system for predicting the new values of the economic variables in the table which would result from hypothesized changes in the economy, determine where methodological difficulties lie, and decide what supplementary data may be needed before their techniques may be tested. In the third stage they will apply the input-output method to research on current and anticipated economic changes in Great Britain.

In support of the second phase of the program the

Foundation in 1957 made a four-year grant of £11,763 (about \$33,525) to the University of Cambridge.

UNIVERSITY OF OSLO  
INSTITUTE OF ECONOMICS

Although input-output analysis offers one of the most promising techniques for investigating and predicting the repercussions of economic change throughout an economy, its usefulness has been limited by the fact that such variables as the response of economic agents to these changes have not been explicitly included. In the next few years Professor Ragnar Frisch, of the University of Oslo, will add such factors to his input-output model of the Norwegian economy.

The additions Professor Frisch plans to introduce—such as, for example, the announced attitudes of government officials responsible for planning decisions and the probable reactions of economic agents such as banks and business firms—should go far toward increasing the accuracy of the predictions yielded by the model. To help finance this research, The Rockefeller Foundation has appropriated 257,040 Norwegian crowns (about \$36,200) to the University of Oslo where Professor Frisch directs the Institute of Economics.

UNIVERSITY OF BASLE  
BASLE CENTER FOR ECONOMIC AND FINANCIAL  
RESEARCH

Organized in 1952, the Basle Center for Economic and Financial Research, Switzerland, is concerned principally with investigation of banking and monetary problems, particularly in their international aspects. Its staff have made comparative and historical studies of such subjects as currency convertibility, central bank policies, and contra-cyclical fiscal and monetary policies. Eighteen papers have

already been published by the center, and four additional monographs are now nearing completion. A seminar sponsored by the center has attracted distinguished speakers holding academic or banking posts in the other countries of Europe and in the United States.

To assist the center through the calendar year 1957, The Rockefeller Foundation made available 220,000 Swiss francs (about \$51,700) to the University of Basle. In 1952 the Foundation contributed \$200,000 toward establishment of the center.

#### INSTITUTE FOR ADVANCED STUDY

##### RESEARCH ON MORALITY AND STRATEGY

No issue in American foreign relations has greater theoretical or practical importance than that of relating moral principles to strategic interests. In an attempt to identify the influences in American life which so often seem to weight American diplomacy on the side of moral principles rather than strategic self-interest, Professor Reinhold Niebuhr of the Union Theological Seminary, New York, will study American diplomacy in the twentieth century. He plans to examine the general framework of political ethics, with its broad standards of peace, justice, equality, and liberty, in the context of the frequently harsh and complex realities of world politics.

A Rockefeller Foundation grant of \$15,000 to the Institute for Advanced Study, Princeton, New Jersey, will help finance Professor Niebuhr's study over the next 18 months.

#### INSTITUTE FOR SOCIAL RESEARCH

##### NORWEGIAN ELECTORAL BEHAVIOR

To test hypotheses concerning the impact of social and industrial change on the electoral process and the resolution

of the vote, the Institute for Social Research in Oslo, Norway, has planned to combine two major empirical approaches in a study of the electoral process in the 1957 Norwegian parliamentary election. A nation-wide survey will include 2,000 interviews with a cross-section of the Norwegian electorate, and will give particular attention to the 21-30 age group because of the importance of the attitudes of first- and second-time voters to the questions raised. At the same time the institute will examine the political behavior of local party leaders and of rank-and-file voters in two representative communities.

To help support the survey through 1958, The Rockefeller Foundation in 1957 made a grant of 105,000 Norwegian crowns (about \$14,800) to the Institute for Social Research.

#### UNIVERSITY OF FLORENCE

#### RESEARCH ON POLITICAL LEADERSHIP

In an attempt to discover the degree to which political leadership in Italy has been marked by change in terms of social classes and economic and political groups, Professor Giovanni Sartori and his colleagues at the University of Florence will study the problem of political representation in terms of the circulation of elite groups of political leaders. The group will trace the pattern of leadership in Italy over an important part of the last half-century, and will examine such subjects as the effects that changes in the Italian electoral system have had upon the social status and vocation of representatives to parliament.

To help finance the study during the next three years, The Rockefeller Foundation has made a grant of 7,440,000 Italian lire (about \$12,300) to the University of Florence.

## OTHER GRANTS

National Institute of Economic and Social Research, London, England: studies in its research program on capital measurement; £6,720 (about \$19,130);

Brandeis University, Waltham, Massachusetts: research on economic development, under the direction of Professor Richard S. Eckaus; \$17,000 for a three-year period;

American Economic Association, Ithaca, New York:

Commissioning and publishing of eight analytical survey articles, by the Editorial Board of the *American Economic Review*; \$13,000 for a six-year period;

Visits to the United States for two-week periods by two Russian economists; \$3,000;

Washington University, St. Louis, Missouri: research in France on French politics and foreign policy, by Professor Roy C. Macridis, Department of Political Science; \$10,000;

Yale University, New Haven, Connecticut: continued research on the theory of economic development, by Dr. Albert O. Hirschman, visiting research professor of economics; \$9,750;

University Institute of Venice, Italy: Institutes of Economic History and of Political Economy; research on the economic decline of Italy, and for the purchase of books and periodicals; 5,768,000 Italian lire (about \$9,520);

University of Vienna, Austria:

Research at leading centers of economic analysis in the United States and Europe by members of the staff of the Institute of Statistics; \$9,500;

Research on structural changes in the Austrian economy, under the direction of Professor Wilhelm Weber, Institute for Political Economy; 75,000 Austrian schillings (about \$3,000);

University of Wisconsin, Madison: research in Great Britain on British foreign policy, by Professor Leon D. Epstein, Department of Political Science; \$9,450;

University of Michigan, Ann Arbor: research on the management of power in international relations, by Professor Inis L. Claude, Department of Political Science; \$8,700;

Harvard University, Cambridge, Massachusetts: a pilot study of social structure in relation to community leadership under conditions of local conflict, under the direction of Professor Samuel A. Stouffer; \$8,200;

University of Chicago, Illinois: completion of a study of the genesis and development of industrial civilization, by Professor John U. Nef; \$7,500 for a three-year period;

University of California:

*At Berkeley:*

Giannini Foundation of Agricultural Economics; to invite Professor Manlio Rossi-Doria, Faculty of Agriculture, University of Naples, Italy, to spend a year of study at the Foundation; \$5,000;

*At Los Angeles:*

Research in British Central and East Africa on modern African political associations, by Assistant Professor James S. Coleman; \$7,390;

Dr. Arthur I. Bloomfield, senior economist, Federal Reserve Bank of New York, New York: research in Europe on the working of the pre-1914 gold standard; \$7,000;

Stanford University, Palo Alto, California:

Completion of a study of the geography of the world's starchy staple food crops, by Dr. Merrill K. Bennett, director, Food Research Institute; \$6,000;

Intensive historical study of an agricultural village in Japan, by Professor Thomas C. Smith, economic historian; \$2,430;

University of Milan, Italy: research in jurisprudence, by Dr. Uberto Scarpelli; 1,870,000 Italian lire (about \$3,000);

Sophia University, Tokyo, Japan: study of bureaucratic organization in Japan, by Dr. Peter F. Munakata; \$2,000;

University of Edinburgh, Scotland: research in the Department of Political Economy on government purchasing policies, under the direction of Professor Alan T. Peacock; £660 (about \$1,880);

Dr. Francis L. K. Hsu, professor of anthropology, Northwestern University, Evanston, Illinois: to complete in India a study of the relationship between Hindu values and way of life; \$800;

Institute for Advanced Study, Princeton, New Jersey: a seminar on "The Historiography of Origins of the Intervention in Russia in 1918"; \$695;

University of Siena, Italy: materials on economic subjects for use by the Institute of Statistics; 90,000 lire and \$55 (about \$205);

Fund for grants of amounts not exceeding \$500 for allocation under the supervision of the Foundation's Director for Social Sciences; \$5,000.

## The Quest for Economic Development

### UNIVERSITY OF THE PHILIPPINES

### TRAINING FOR ECONOMIC DEVELOPMENT

For some time the University of the Philippines has been concerned with the urgent need of the Republic and of other countries of Southeast Asia and the Far East for experts familiar with the problems and techniques of economic development. With the assistance of the Philippine and United States governments, it has strengthened its programs in economics, public administration, and related subjects, and has accepted an increasing number of students from neighboring countries who come to the university for specialized training. To help the university expand present programs and institute new ones in disciplines relevant to economic development, The Rockefeller Foundation made four grants totaling \$341,500 during 1957.

The newly created Institute of Economic Development and Research received \$201,500 to finance construction of the library wing of its new building, to purchase library materials, and to send Filipino scholars at the postgraduate and postdoctoral level abroad for advanced study. The institute building will also house the College of Business Administration and the Graduate School of Economics, and thus make possible close collaboration among the three units of the university. It will, in addition, provide a center to which young professional economists of the Central Bank, the Economic Planning Board, and other development agencies can come for research and for the exchange of ideas.

The Institute of Public Administration, aided by the Foundation since 1955, received two grants in continued support of its research and training program. Founded in 1952 under a University of the Philippines-University of Michigan contract, with financial help from the International Cooperation Administration, the institute has since developed an academic program leading to both undergraduate and graduate degrees, the best university library in public administration in the Far East, and an active research and publication program. A grant of \$94,000, available through 1960, will provide funds for the training abroad of members of the institute staff, for the expenses of visiting American professors, and for professional consultants, library materials, and commissioned research. A small grant of \$6,000 will ensure that institute staff members now in the United States are able to complete their studies for the doctoral degree.

The Statistical Training Center, opened in 1954, received a \$40,000 grant during 1957. With these funds the center will award fifteen training scholarships over a five-year period to enable statisticians from Southeast Asian countries—principally Indonesia, Malaya, Thailand, and

Vietnam—to study for the Master's degree given by the center.

#### UNIVERSITY OF CHILE

##### PROGRAM IN ECONOMICS

The increasing demand in Latin America for highly qualified economists, particularly to teach in the universities, and the absence of a graduate school of economics anywhere on the continent, led the Union of Latin American Universities meeting in 1953 to recommend creation of the new Graduate School of Economics at the University of Chile. The school was established in March of 1957.

Students in the new program will concentrate on economic analysis, economic history, and one specialized branch of economics in the first year, and devote a second year to research for a thesis in the university's Institute of Economic Research or its Institute of Public and Business Administration. Seminars, tutorials, and the combination of practical work with theoretical studies are all significant features of the program as it is planned.

While it develops its graduate curriculum in economics, the University of Chile is also providing for the growth of its Institute of Economic Research, established in 1949. The institute, which has gained distinction for pioneering work in South America on national income estimation, is undertaking four additional major research projects of both academic and practical interest either for Chile or for Latin America as a whole.

The first project is a study of the productivity of the national economy to be based on sample analyses of selected firms. The others include a labor force survey, the first in Chile, in Greater Santiago; an investigation of the effects of the country's complex social security system on its de-

velopment; and an examination of the local economic influence of British and other foreign companies in the nineteenth century. As part of their function these investigations are expected to add to the strength of the new Graduate School of Economics, since student participation in the institute is an important part of the graduate curriculum.

On the understanding that the university will contribute approximately equal amounts in special allocations, the Foundation in 1957 made a three-year appropriation of \$66,400 to the University of Chile toward the development of the Graduate School of Economics, and a four-year grant of \$105,000 to help finance the activities of the Institute of Economic Research.

#### JOHNS HOPKINS UNIVERSITY

#### SOUTHEAST ASIA PROGRAM

The School of Advanced International Studies of the Johns Hopkins University embarked on an interuniversity program with a sister institution in Southeast Asia early in 1954. In cooperation with the University of Rangoon a study center was organized in Burma to facilitate research and training in history, political science, and economics. Under the arrangement one senior faculty member and three selected graduate students from the Hopkins school have been continuously in residence in Rangoon where they work in close association with faculty and students.

The Burma center has contributed toward a greater mutual knowledge and understanding of Burma and the United States and has provided, at the same time, a constructive means for strengthening the curricula of both institutions. In recognition of its success, the School of Advanced International Studies recently expanded its Southeast Asia program by initiating a second interuniversity proj-

ect in cooperation with the Gadjah Mada University in Djogjakarta, Indonesia.

The American visitors in Southeast Asia offer undergraduate courses and graduate seminars on problems of international trade, American history, political science, and American foreign relations; participate with members of the host faculty in seminars on general aspects of national development; and help organize undergraduate work in international relations. In support of the Johns Hopkins Southeast Asia program, The Rockefeller Foundation has made a five-year grant of \$99,000.

#### GETULIO VARGAS FOUNDATION

#### ADVANCED TRAINING IN ECONOMICS

Brazil, like many other nations with rapidly developing economies, is confronted with a critical shortage of well trained economists to staff its various development agencies. For some years the Getulio Vargas Foundation, which promotes education and research under the sponsorship of the government, has undertaken a number of different activities in an effort to ameliorate this shortage and to strengthen economic research and training. Under its newest program approximately ten promising Brazilian graduates in economics will be given an opportunity for special research training and advanced study abroad.

The graduates will spend one year in supervised research at the Brazilian Institute of Economics, an operating agency of the Vargas Foundation and one of the distinguished economic research centers in Latin America. They will then be sent abroad for a year of study and, on their return, will be offered a third year of in-service research training at the Development Bank of Brazil. At the conclusion of their training the students will be expected to spend at least two years in positions with public or semi-

public agencies or in part-time teaching posts at the University of Brazil.

To help finance the program, The Rockefeller Foundation has appropriated \$80,000, available over a seven-year period, to the Getulio Vargas Foundation, Rio de Janeiro.

NATIONAL INSTITUTE OF ECONOMIC AND  
SOCIAL RESEARCH

CONFERENCES ON INCOME AND WEALTH

For some years the International Association for Research in Income and Wealth has held biennial European conferences which serve as forums for the discussion of problems in the field of national income research. The association now plans to hold a new series of conferences in and for underdeveloped countries in an effort to establish contacts with workers in the field, find ways of aiding their researches on income and wealth, and acquaint them with the results of European and American investigations. The association also hopes to discover the extent to which techniques adopted from Western countries meet the needs of unindustrialized countries, and to consider how national accounts should be set up for the needs of development programs.

To help the International Association hold conferences in Asia, Latin America, and Africa, The Rockefeller Foundation has made a five-year grant of \$52,000 to the National Institute of Economic and Social Research, London, England.

JOHNS HOPKINS UNIVERSITY  
DEPARTMENT OF POLITICAL ECONOMY

One of the United States' outstanding graduate training centers in the field, the Department of Political Economy

of the Johns Hopkins University in 1951 was assisted by the Foundation with the expenses of six visiting professors from European countries each of whom spent half the school year with the department. Its increasing concern with non-European countries of the world has led the center to propose a new plan under which at least half the visiting professors to be invited during the next five years will come from India and Japan.

The visiting professors will participate fully in the teaching and research programs of the department, including the weekly seminar attended by faculty, postdoctoral fellows, and graduate students, at which research plans and papers and lectures by visiting scholars are presented.

To help with the expenses of the visiting professors during the next five years, The Rockefeller Foundation in 1957 made a new grant of \$50,000 to the Johns Hopkins University.

#### INDIAN SCHOOL OF INTERNATIONAL STUDIES

##### LIBRARY DEVELOPMENT

Soon after India's attainment of independence a group of the country's leading citizens and scholars began planning the organization of a school to offer advanced training in basic social science disciplines, in international affairs, and in the history and institutions of countries or regions of particular importance to India's own foreign affairs. Their efforts resulted in the establishment in New Delhi, in 1955, of the Indian School of International Studies as a national center for doctoral study and advanced research in the field.

To assist studies of the major areas of Asia, which the school has from the beginning chosen for primary emphasis, The Rockefeller Foundation in 1957 appropriated \$50,000 for the purchase of important library materials during the

next seven years. The new acquisitions will also be at the disposal of the Indian Council of World Affairs, which has made plans to share permanently with the school its own excellent library facilities and resources.

UNIVERSITY OF CHICAGO

DEPARTMENT OF ANTHROPOLOGY

The Department of Anthropology of the University of Chicago, Illinois, has attempted, since 1947, to bring at least one visiting professor a year from a foreign country to enrich and supplement the faculty's specialized professional interests. Without special funds for this purpose, however, the department has had to limit its invitations to those visitors already in the United States.

Under a more formal program made possible by a \$30,000 grant from The Rockefeller Foundation, the Department of Anthropology will be able to plan for visiting professors more effectively and to assume their traveling expenses when necessary. About half the visiting anthropologists will come from India, the Philippines, and Latin America, areas in which the Chicago staff have long-standing interests, and the balance from countries in Europe, Asia, and Africa. Foundation funds, available over a ten-year period, will help finance visits by one or two scholars yearly.

AMERICAN UNIVERSITY OF BEIRUT

ECONOMIC RESEARCH INSTITUTE

An important factor in economic growth and development is the entrepreneur, the human agent who mobilizes and combines economic resources for productive purposes. The emergence of the entrepreneur in the Arab East and the social-cultural-political milieu in which he must perform will be the focal points of a study of entrepreneurship in

relation to economic development in Lebanon, to be undertaken by the Economic Research Institute of the American University of Beirut.

Under the leadership of Professor Yusif A. Sayigh, a group of economists, sociologists, and political scientists will consider such problems as the special role of the entrepreneur in less developed economies; the factors influencing the emergence of the entrepreneur; the availability and focal point of enterprise; and the relation between the availability of enterprise and development needs.

Toward support of the study, The Rockefeller Foundation has appropriated \$44,100 for use over a three-year period.

#### ROYAL INSTITUTE OF INTERNATIONAL AFFAIRS

#### RELIGION AND POLITICS IN BURMA

Although in many Asian countries religion is one of the most important cultural influences, relatively little is known in the West about its full impact on Asian society. A study of religion in relation to political attitudes and behavior in Burma, to be conducted by Dr. E. M. Mendelson under the auspices of the Royal Institute of International Affairs, is expected to make a substantial contribution to Western understanding of the force of religion in Asian life. Among the topics to be explored by Dr. Mendelson are the role of Buddhism in daily life, its influence on the economy, social welfare, social prestige, and status, the links between government and religion and between political and religious officials, and the implications of Buddhism as a religious movement broader than the Burmese nation.

To help support Dr. Mendelson's research during a three and one-half year period, The Rockefeller Foundation has appropriated £7,200 (about \$20,520) to the Royal Institute of International Affairs, London, England.

**OSAKA UNIVERSITY****INSTITUTE OF SOCIAL AND ECONOMIC RESEARCH**

The staff of the Institute of Social and Economic Research of Osaka University, Japan, have in only a few years acquired a distinguished reputation for their work in aggregative economics and econometrics, short-term economic forecasting, and the structural analysis of Japan's foreign trade. In addition to research monographs, they publish a Japanese-language scientific quarterly and a semi-annual volume containing papers in English, French, or German.

The Foundation in 1957 gave \$37,700 to Osaka University primarily to help the institute bring a visiting professor to Japan, send one of its staff abroad to observe the programs of similar institutes, and acquire necessary library and other materials. Part of the financial support of the institute comes from commercial and industrial leaders in the Osaka-Kyoto-Kobe area who recently joined with the university in forming the Osaka University Foundation for Research in Economics as a means of channeling to the institute substantial support from local sources on a long-term basis. To help the foundation set up a revolving fund for the institute's research publications, The Rockefeller Foundation appropriated \$2,300 during 1957.

**WASEDA UNIVERSITY****ECONOMICS OF HIGHWAY TRANSPORTATION IN JAPAN**

Many pressing highway transportation problems have been created in Japan by the country's recent, strikingly rapid population and economic growth. To help find solutions to these problems Waseda University, Tokyo, will conduct a study of highway transportation in Japan in relation to the economic and social setting. Relevant data will be collected and analyzed under the supervision of two

leading professors of transportation economics who will work with other outstanding academicians and engineers from various universities and the government. American experience will be brought to bear through a three-month study trip to the United States by the codirectors, and through later visits to Japan by two American consultants.

The study will deal with such questions as the effect on economic growth in the past of an inadequate highway network; the capacity of present development programs to meet future needs; and the necessity and feasibility of a system of superhighways.

The Rockefeller Foundation has made available \$20,300 to Waseda University for use during the next two years toward support of the study.

#### HITOTSUBASHI UNIVERSITY

#### INSTITUTE OF ECONOMIC RESEARCH

One of Japan's most distinguished centers for research in the social sciences, Hitotsubashi University in Tokyo has since 1951 sponsored research by its Institute of Economic Research on economic growth and capital formation in Japan. With the ultimate goal of determining the fundamental characteristics of Japan's present rapid economic development, the institute staff are engaged on long-term measurement of economic growth and capital formation since the Meiji Restoration (1868) and on the formulation of an appropriate theoretical model based on the data gathered in the historical study. Apart from its usefulness to the Economic Planning Board of Japan, the study is expected to yield as by-products suggestions valuable to economic planning in underdeveloped countries, particularly in Southeast Asia.

Toward the expenses of the institute research project during the next three years, The Rockefeller Foundation

in 1957 appropriated 6,661,000 yen (about \$20,000) to Hitotsubashi University.

CATHOLIC UNIVERSITY OF CHILE

ECONOMIC RESEARCH CENTER

The Catholic University of Chile, in cooperation with economists from the University of Chicago, recently established an Economic Research Center to carry on both research and training in different fields affecting agricultural and industrial development in Chile. To help the university finance two research projects at the center, The Rockefeller Foundation in 1957 made a two-year grant of \$19,000.

Foundation funds will be used toward studies of various factors influencing agricultural development, and of the effects of inflation upon wages and consumers' budgets.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CENTER FOR INTERNATIONAL STUDIES

Members of the Center for International Studies of the Massachusetts Institute of Technology will conduct research in small towns representative of three Indonesian regions to determine the factors influencing or hindering the development of the political leadership needed to bring the nationalist goals and activities of the metropolitan centers into peasant life. The study will concentrate on the typical social composition of the leadership group in small towns, and on the differential effects upon it of varying regional traditions.

A Rockefeller Foundation grant of \$14,000 will help the Massachusetts Institute of Technology defray the expenses of the study during the period ending October 31, 1958.

## KYOTO UNIVERSITY

## STUDY OF RURAL SOCIETIES

In 1951 Dr. Jisho Usui, professor of sociology at Kyoto University, undertook a study of 33 Japanese villages in order to determine what effect the present rapid modernization of Japan is having on the values held by the rural population. In villages which vary from isolated, extremely inaccessible ones to those which are in constant daily contact with the large urban areas from which modernizing influences are believed to emanate, Professor Usui and his co-workers are systematically collecting data on the ways in which beliefs and practices are changing in ten categories such as personal and family mores, religious connections and practices, and political beliefs.

A Rockefeller Foundation grant of 3,744,000 yen (about \$11,200) to Kyoto University, Japan, will make possible completion of the study within the next five years.

## OTHER GRANTS

University of Calcutta, India: research in economic history in the Department of History; 76,500 rupees (about \$16,700) for a two-year period;

Center of Latin American Monetary Studies, Mexico City, Mexico: a special six-month training center in national accounts for selected government officials and members of the research staffs of central banks in Latin America; \$10,000;

Getulio Vargas Foundation, Brazilian Institute of Economics, Rio de Janeiro:

A pilot project to test the feasibility of a large-scale sample survey of the structure of the agricultural economy of Brazil; \$10,000;

English language publications for the library of the institute; \$800;

Robert College, Istanbul, Turkey: a program of research on Turkish economic development; \$10,000;

Professor Horace Miner, Department of Sociology, University of Michigan, Ann Arbor: to conduct field research on cultural change in northern Nigeria; \$9,900;

Hitotsubashi University, Tokyo, Japan: study of the economic modernization of Asia, by Yoichi Itagaki, dean, Department of Economics, and professor of economic policy and international relations; \$7,200;

University of Ankara, Turkey: Dr. Edward C. Smith, Professor Emeritus, New York University, New York; to continue teaching and research in political science at the University of Ankara; \$6,670;

Institute of International Relations, Brussels, Belgium: a study of economic development with special reference to the problems thereof as seen by a developed small country; 300,000 Belgian francs (about \$6,300);

American University at Cairo, Egypt: research on population trends with special reference to the Middle East, by Professor Hanna Rizk, director, Division of Extension, and Dr. Mohammad El Badri, professor of statistics, University of Cairo; 2,050 Egyptian pounds (about \$5,900);

Victoria University of Manchester, England: completion of a study of the problems of land usage and tenure in relation to economic development in traditional systems of subsistence agriculture, by W. Allan, Simon Senior Research Fellow; £2,000 (about \$5,700);

National Chengchi University, Taipei, National Republic of China: books for the graduate schools; \$5,000;

Wayne University, Detroit, Michigan: a study of problems of inflation and industrial growth in Latin America, by Dr. David Felix; \$5,000;

Nagoya National University, Japan: books in the social sciences; \$2,400;

Agra University, India: books for the library of the Institute of Social Sciences; \$2,050;

University of Illinois, Urbana: a survey of the status of teaching and research in agricultural economics in Latin America, by Professor

H. C. M. Case, secretary, International Conference of Agricultural Economists; \$2,000;

Kyushu University, Fukuoka, Japan: books in the social sciences; \$1,650;

University of Dacca, Pakistan: books in the social sciences; \$1,400;

Hirosima University, Japan: books in the social sciences; \$1,275.

## Problems of Contemporary Western Society

PRINCETON UNIVERSITY

CENTER OF INTERNATIONAL STUDIES

The Center of International Studies of Princeton University is distinguished both in the United States and abroad for the quality of its research in four major areas—the formulation and execution of foreign policy; diplomacy; national security and military policy; and foreign economic problems and policies. Among the important topics under study by the staff are politics and foreign policy in the Near East, the diplomacy of the Japanese peace settlement, United States policy toward EURATOM, and the common market scheme for integrating the economies of Western European countries.

To coordinate the work of the center more closely with the instructional program at Princeton, the university recently placed the administration of the center under an interdepartmental committee whose membership includes representatives of the Departments of Politics, Economics, Sociology, and History, and the Woodrow Wilson School of Public and International Affairs. The link between teaching and research, and between the work of the center and of the social science departments, has been further strength-

ened by the assistance the center gives related research carried on by Princeton's teaching faculty.

To help Princeton University continue the integration of the center's research with its teaching program in international studies, The Rockefeller Foundation in 1957 made a new grant of \$200,000, available during a five-year period. The Foundation has supported the work of the center since 1935 when, as the Institute of International Studies, it was attached to Yale University.

#### INSTITUTE OF JUDICIAL ADMINISTRATION, INC.

The Institute of Judicial Administration, Inc., New York, was founded in 1952 with four main objectives: to encourage the development of a science as well as an art of judicial administration; to supply, on request from any state, information as to all the data available on any subject of judicial administration or court procedure; to hold state, regional, and national conferences to encourage improvement in the administration of justice; and to publish studies in judicial administration, including one on the techniques of achieving law reform. The institute's membership now includes more than 650 judges, lawyers, and private citizens concerned with judicial administration from every state, the District of Columbia, Puerto Rico, and Hawaii. The facilities and publications of the institute have been made available to newspapers, law schools, legal bodies, and individuals interested in the field.

To date the Institute of Judicial Administration has completed and published a total of 63 studies on a wide range of subjects, conducted annual studies of court delay and congestion in selected jurisdictions, and prepared an annual survey of American judicial administration. Among its special projects have been investigations of procedures and practices in criminal appeals in state supreme courts,

the costs of such appeals, the disposition of court records, and ways by which criminal law enforcement procedures might be improved. Institute staff members have served in a consultative capacity to official agencies in Puerto Rico and Alaska, and in a somewhat related but less formal activity, the institute has supplied information and advice, and arranged tours of courts and law enforcement offices, for more than 120 lawyers and judges from some 42 different countries.

In 1952 The Rockefeller Foundation contributed \$250,000 toward the establishment and initial expenses of the Institute for Judicial Administration. A new grant of \$150,000, made during 1957, continues Foundation support for a period of three years.

#### NATIONAL PLANNING ASSOCIATION

#### ECONOMICS OF COMPETITIVE COEXISTENCE

In 1956 the National Planning Association, Washington, D.C., initiated a study of the economic aspects involved in the coexistence of Western and Communist nations. The research includes analysis of the economic aspirations and expectations of underdeveloped and "intermediate" countries, examination of the capacity of Western and Communist countries to contribute toward the realization of these aspirations, and discussion of the techniques and policy devices used by or available to the two power blocs in their competition for economic and political influence. Consideration is being given to historical, institutional, and cultural factors which may influence the responsiveness of the underdeveloped countries.

To supplement funds previously made available for the study, and carry Foundation support through the period ending September 30, 1959, The Rockefeller Foundation has made a new grant of \$25,000.

**OTHER GRANTS**

Social Science Research Council, New York: exploration of the usefulness and feasibility of a study of social trends in the United States; \$10,000;

Foreign Policy Society of Denmark, Copenhagen: a study of the economic balance of power; 66,200 Danish crowns (about \$9,700);

Columbia University, School of International Affairs, New York: research on procedures and techniques of United Nations semi-parliamentary diplomacy, by Dr. Alexander W. Rudzinski; \$9,500;

Kermit Roosevelt Fund, Washington, D.C.: toward the stabilization of a program of exchange lectureships between Great Britain and the United States on the military aspects of foreign policy; \$6,000;

Carnegie Endowment for International Peace, New York: toward the expenses of American participants in the discussions of the "Bilderberg Group"; \$5,000;

Pennsylvania State University, University Park: research into the role of Soviet ideology and national interest in the formulation of Soviet foreign policy, by Assistant Professor Vernon V. Aspaturian; \$3,700;

Bryn Mawr College, Pennsylvania: study of constitutional and international law doctrine and practice relevant to the foreign affairs power of the United States government, by Professor Gertrude C. K. Leighton, Department of Political Science; \$3,500;

University of Maryland, College Park: research on collective security and the principles of international relations, by Professor Roland N. Stromberg, Department of History; \$3,500.

## Legal and Political Philosophy

UNIVERSITY OF OXFORD

LAW LIBRARY

The University of Oxford has long exercised a unique and far-reaching influence on legal thought in many different

countries, and because of its high reputation and emphasis on comparative law, attracts students from all parts of the world. Particularly in recent years it has become a center for scholars, civil servants, and magistrates from Commonwealth countries and from the newer nations of Africa, the Middle and Far East, and Southeast Asia.

To make its collections on law more readily available, the University of Oxford plans the construction of a new library which will permit it to bring together books and papers now in the Bodleian or scattered among the libraries of the colleges. The library, to occupy three sides of a new quadrangle, will eventually accommodate 465,000 volumes on law, and will also provide lecture rooms, administrative quarters, and carrels for the students. It will be administered by the Bodleian as a dependent library.

Toward the £290,000 needed to build, equip, and furnish the law library, The Rockefeller Foundation in 1957 contributed £150,000 (about \$427,500). The grant, available through June 30, 1960, and payable as the university secures £140,000 from other sources, renews substantial support which the Foundation gave for the Bodleian Library at Oxford before World War II.

SOCIAL SCIENCE RESEARCH COUNCIL  
FELLOWSHIPS IN LEGAL AND POLITICAL PHILOSOPHY

The challenges presented to such traditional values as freedom, justice, and democracy not only by the successes of totalitarian states but also by the increasing complexity of modern life have led growing numbers of scholars to re-examine the deeper values and goals underlying society and government. Instead of concentrating on the sheer practical problems of social and political life, these scholars are exploring such topics as power, authority, political responsi-

bility, and the roots of freedom and its relationship to the individual and his development.

To assist promising young scholars at the predoctoral and immediate postdoctoral level to pursue their researches in the field of legal and political philosophy, the Social Science Research Council, New York, inaugurated a special fellowship program in 1954 under which 20 awards have been made. To make possible the appointment of 20 to 30 additional fellows under the program during the next five years, The Rockefeller Foundation appropriated \$86,250 to the council during 1957.

For the past five years the Foundation has sought to encourage the development of work in legal and political philosophy through grants in aid awarded directly to scholars and support of the Social Science Research Council's program of training and research awards in the field.

#### OTHER GRANTS

Harvard University, Cambridge, Massachusetts: research on the operation of land use planning laws in England, by Professor Charles M. Haar, Law School; \$10,000;

West Virginia University, Morgantown: study of American legal utilitarianism, by Dr. Gerhard O. W. Mueller, associate professor of law; \$8,500;

University of Texas, Austin: research on the contribution of the philosophical and subordinate normative sciences to the process of normative judgment in positive law, by Dr. Joseph P. Witherspoon, Jr., professor of law; \$7,750;

Ohio Wesleyan University, Delaware: research on the theory and practice of political power, by Dr. Eugene V. Walter, associate professor of political science; \$6,700;

Brandeis University, Waltham, Massachusetts: completion of a study of the changing nature of American liberty, by Dr. John P. Roche, chairman, Department of Politics; \$5,500;

University of Maryland, College Park: analysis and evaluation of the anti-federalists of 1787-1789 in comparison with the federalists, and preparation of parallel editions of the best writings of both, by Dr. Thornton Anderson, assistant professor of politics; \$5,500;

University of Chicago, Illinois:

An historical study of the problem of freedom of thought and expression in political theory, by Dr. Allan D. Bloom, lecturer in liberal arts; \$5,475;

Study in Chicago of the interrelations among the social philosophies of Adam Smith, Hegel, and Marx, by Dr. Joseph Cropsey, assistant professor of political science, The City College, New York; \$4,850;

Completion of a treatise on the Hebrew and Greek origins of the values underlying Western civilization, by Dr. Leo Strauss, professor of political philosophy; \$2,000;

Bryn Mawr College, Pennsylvania: reexamination of the basic assumptions of freedom of speech in relation to democratic theory, by Dr. Peter Bachrach, associate professor of political science; \$4,500;

Amherst College, Massachusetts: completion of a study of the theory and practice of comparative political institutions, by Dr. Karl Lowenstein, William Nelson Cromwell Professor of Jurisprudence and Political Science; \$4,400;

Duke University, Durham, North Carolina: completion of a study of the political thought of Leon Blum, by Dr. Joel Colton, assistant professor of history; \$3,700;

Tokyo University, Japan: research at the University of Oxford, England, on problems of democratic theory in the nineteenth century, by Dr. Kan-ichi Fukuda, assistant professor of political science; £720 (about \$2,050);

University of London, London School of Economics and Political Science, England: preparation of an analytical treatise on political philosophy, by Dr. J. W. N. Watkins, lecturer in political science; £577 (about \$1,630).

## Travel Grants

Dr. Tosio Kitagawa, professor of mathematical statistics and director, Mathematical Institute, Kyushu University, Fukuoka, Japan: to visit and study in the United States; \$6,600;

Professor Tsuruji Kotani, professor of international law and relations, Hiroshima University, Japan: to visit and study at centers of international law in the United States; \$6,000;

Professor Nils Stjernquist, Department of Political Science, University of Lund, Sweden: to visit university centers of teaching and research in political science in the United States; \$4,250;

Kuraji Ogura, professor of local government, Tokyo Municipal University, Japan: to visit centers of research and training in public administration in the United States; \$4,000;

Alan R. Prest, bursar and fellow of Christ's College, University of Cambridge, England: to visit graduate centers for teaching and research in fiscal economics in the United States and Canada; \$3,500;

Constantin Th. Dimaras, director-general, State-Scholarships Foundation, Athens, Greece: to visit research centers and universities in Europe and the United States; \$3,150;

Dr. Tarik Z. Tunaya, University of Istanbul, Turkey: to visit European centers of political science and international relations; \$1,605;

Sayid Sami Jalil, acting director, Central Statistical Office, Ministry of Economics, Baghdad, Iraq: to study the operation of central statistical offices in Italy, Denmark, Norway, Sweden, and Ireland; \$1,425;

Dr. Fadil H. Sur, director, Institute of Public Finance, University of Ankara, Turkey: to visit social science research institutes in Scandinavia, the United Kingdom, and on the Continent; \$1,325;

Toshinosuke Kashiwazaki, economist, Waseda University, Tokyo, Japan: to return to Japan after study in the United States; \$625;

Kazuo Kitagawa, professor of international economics, Nagoya National University, Japan: to extend a study visit to the United States; \$600.

## **The Humanities**

**THE HUMANITIES**

*Major Interests, 1957*

Intercultural Studies .....	\$ 912,650
Humanistic Research .....	331,300
The Arts .....	7,824,500
Special Projects .....	879,720
Fellowships .....	350,000
Grants in Aid .....	425,000

# THE HUMANITIES

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FOR SOME YEARS NOW the grants of the Foundation in the humanities have been reported under four major headings, Intercultural Studies, Humanistic Research, the Arts, and Special Projects. While it is convenient to retain these headings and thereby a certain continuity in reporting and classification, in some respects any simple classification is misleading in that it emphasizes only one of the several points of view from which a project may justify support.

## INTERCULTURAL STUDIES

Most grants under the humanities program in intercultural studies might also be reported under the other headings which follow. During 1957, for example, a grant was made to the School of Oriental and African Studies of the University of London so that it might during the next five years invite to London a group of younger historians from countries of Southern Asia; and another grant was made to the American Historical Association to enable it, in co-operation with American universities, to bring to the United States selected scholars from South Asia and Great Britain. Both these projects are clearly in the field of history and both will benefit individual scholars, but they are mentioned here under intercultural studies because they are among a group of projects all of which are directed toward the development of more competent scholarship and deeper

understanding of Southern Asia in the United States and other countries of the West.

During 1957 also, further help was approved to the major language project of the Deccan College Postgraduate and Research Institute in Poona, India. The principal purpose of this project has been the development of scholarly competence in the linguistic research which India needs to deal constructively with its very serious language problems. The Deccan College program, however, has also helped to train a substantial number of young American linguists studying the principal languages of India. From this point of view it belongs with another grant to the Association for Asian Studies for its Committee on South Asian Languages to advance training and research on the major languages of India today, and both are reflections of a paramount concern with Indian studies. Here belong also smaller grants to the University of Chicago for research in Indian cultural history, and to the University of Minnesota for exploration of new approaches to the study of Indian philosophy.

A similar interest in the development of Western scholarship on the Middle East links a series of grants: to the University of California at Los Angeles for a manual on Islamic civilization; to Stanford University for studies of the history of the Turkish Revolution; to the University of London for a conference on historical writing on the Middle East; to Harvard University for a study of Soviet policies in the Middle East after 1917; to St. Antony's College, Oxford, for Near Eastern studies; and to the American University at Cairo for further assistance to the distinguished work on Muslim art and architecture by Professor K. A. C. Creswell. A travel agent for Dr. Constantine Zurayk will help to bring some of these studies in Europe into closer relationship with the American University of Beirut.

The Foundation balances its interest in advancing scholarship on other areas with support to American studies in other countries, as is illustrated by additional support to American studies at Tokyo University and smaller grants to the Gadjah Mada University, Djogjakarta, Indonesia, to the University of Ceylon, and to the University College of Wales, Aberystwyth.

The Rockefeller Foundation also continued during 1957 to aid projects for the increase of scholarly attention in the universities of Asia to the cultures of neighboring countries. Grants were made to the University of Rangoon, Burma, for books and materials on modern Asia; to the University of the Ryukyus in Okinawa for the appointment of a professor of Chinese; to Waseda University in Tokyo, Japan, for continuation of studies on Indonesia; to the University of the Philippines in Manila for visits to Japan, Korea, and Formosa by the writer, N. V. M. Gonzalez; and to S. H. Vatsyayan, writer and editor of New Delhi, India, to enable him to study literary and cultural trends in countries of East and Southern Asia. Further help was also given to the Sixth Section of the Ecole Pratique des Hautes Etudes in Paris for expanded studies of various parts of the world.

Two grants under intercultural studies perhaps deserve special mention. The scattered islands of the Pacific have been relatively neglected in American academic work. It is encouraging that the University of Hawaii is developing its research interests in territories in the Pacific, and The Rockefeller Foundation has been happy to provide assistance for library acquisitions. A smaller grant to Stanford University will make possible continuation of a very productive effort to apply Western concepts of literary criticism to Japanese poetry. This project, in which two American and one Japanese scholar are participating, has already led

to mutual recognition of ways in which two such disparate schools of criticism can supplement each other.

#### HUMANISTIC RESEARCH

In the grants just reviewed under intercultural studies a substantial proportion of support will go to research by individual scholars and might thus with almost equal validity be discussed under the heading of humanistic research. There are in addition a considerable number of grants in which the intercultural element is not dominant but rather where the emphasis is on the contribution which the research can make to general knowledge and understanding. More work is in progress, and more needs exist, in any one of the humanistic disciplines than any single foundation can consider helping; hence, general support for any discipline is impracticable, and choice of a few lines of research development that appear to offer special promise of widening intellectual or aesthetic horizons is essential.

The Foundation has been concerned for some time with distinguished original work in philosophy. Here, because of the nature of the work, most of the grants are small, as can be seen in the assistance given for Professor Julián Marias' critical reconstruction of the philosophical system of José Ortega y Gasset; for examination of political philosophy and ethics in Great Britain by Professor Alan Gewirth and Dr. Hiram J. McLendon; for Professor Iredell Jenkins' investigation of the function and structure of law in a democratic society; for Professor Gail Kennedy's studies of the philosophy of John Dewey; for Professor Ernest Nagel's continuing work on the philosophy of science; for visits to centers of philosophy and the social sciences in the United States by Professor Frederick Broadie of Edinburgh; and for studies in value theory by A. S. Ayyub of Calcutta.

In addition, however, the somewhat larger grants to the Free University of Berlin, to the University of Fribourg, Switzerland, and to the International Institute for Social History in the Netherlands for work on Marxism and Leninism, and further assistance to the editing of the writings of Alexis de Tocqueville are also for individual research undertakings. The emphasis on ethics and on political and social philosophy which is evident in many of these grants parallels the interest in political and legal philosophy of the Foundation's program in the social sciences.

A grant to Kokugakuin University in Tokyo, Japan, deserves special mention here since the university's research on Japanese cultural traditions and on comparative religion and anthropology is aimed at providing a foundation for re-examination of contemporary religious philosophy, particularly in Shinto.

In addition to a sizable number of projects on Asian, American, or Russian history already mentioned, The Rockefeller Foundation during 1957 made a second grant to Columbia University for completion of the editing of the papers of Alexander Hamilton, and supported a variety of smaller historical undertakings. In the field of Latin American history there was renewed support to the Colegio de México to enable the competent team led by Professor Daniel Cosío Villegas to move on toward research on the Mexican Revolution; to Professor Eugenio Pereira Salas of the University of Chile, Santiago, for a general historiography of Hispanic America; and to the Academy of American Franciscan History, Washington, D.C., for what proved to be a very stimulating conference on the history of religion in the Americas.

In European history additional assistance was given to the University of Chicago for continuation of studies of the life of the Marquis de Lafayette by Professor Louis Gottschalk; to Harvard University for work on Russian

history by Professor Michael Karpovich; to the University of London for explorations in parliamentary history under the direction of Sir Lewis Namier; to the University of Oxford for research on the Reformation in Poland and Lithuania by Dr. Stanislas Kot; to the University of Vienna for work on the later phases of the Austro-Hungarian Empire; and to the Royal Asiatic Society, London, for preparation of a book on Robert de Nobili by Vincent Cronin. One grant to Columbia University for investigations in the history of Islam in India by Professor I. H. Qureshi continues a long-standing interest of the Foundation in more adequate interpretations of modern South Asia.

The Foundation in 1957 gave further support, after a lapse of some years, to El Colegio de México for work in the field of philology and literature which has become well known through the journal *Nueva Revista de Filología Hispánica*.

Despite the important role which languages play in education, public administration, and politics, and the consequent importance of public decisions, there has been surprisingly little systematic study of what one might call linguistic policy, especially in multilingual countries. The Foundation was happy, therefore, to be able during 1957 to give assistance to the small projects in this field at Columbia University under the direction of Professors Uriel Weinreich and John Lotz, respectively. It is to be hoped that this is a field which will receive increasing attention in the future.

While the Foundation has not been active during recent years in history of the arts, support has been provided from time to time to projects of research where the relation to contemporary developments in the arts is clear and promising. Examples are assistance to the Brooklyn Museum for the work of Miss Una Johnson on print-making in the twentieth century; to the Westminster Choir College for preparation of a selected bibliography of choral music; to

the University of Dacca, Pakistan, for critical studies of contemporary Bengali literature; to Harvard University for work on the history of the Bauhaus; and to the Tokyo University of Arts for a microfilm of Western music scores.

#### THE ARTS

The third heading, the arts, continues to represent an attempt to explore what a foundation committed to systematic philanthropy can contribute in this field. Here again general needs are of an order that for The Rockefeller Foundation precludes general support; rather, the Foundation's concern must be essentially developmental. This does not mean that the Foundation will necessarily turn aside from compelling opportunities of major proportions—as its grants reported below to the Lincoln Center for the Performing Arts indicate—but even a rapid calculation of the resources of the Foundation will show that such grants must be rare.

In the arts, the Foundation must ordinarily take advantage of opportunities that are strategic, involving relatively modest financial needs. Moreover, it must generally confine itself to efforts likely to have broad effect—in the United States, for example, to efforts that are actually or potentially national. Thus during 1957 the Foundation was able to assist local or regional American musical organizations only where they gave promise of setting patterns of wider importance. It should be noted that the Foundation's concern with the arts is still basically restricted to the United States and Canada, except as special opportunities and needs offer themselves in the geographical area of the Foundation's expanded program in Asia, Africa, and Latin America.

Special attention has been given to organizations which have shown high standards of artistic judgment and which

through temporary and modest assistance appear able to establish themselves on an improved long-term artistic, administrative, and financial basis. New York Pro Musica Antiqua is a good example. Having established its aims and standards during the past few years, it seems now ready, with the help given it in 1957, to move toward a larger program of national service. The experimental program of the Walker Art Center in Minneapolis for the promotion of the use of art in the northern plains area is another example.

Fortunately, public interest in contemporary music and consequent support for the composer has increased substantially since the initial Rockefeller Foundation grant made in 1953 for the recording program of the Louisville Philharmonic Society. During 1957, however, there were two smaller opportunities to strengthen this trend. The American International Music Fund developed a plan for tape recording performances by major American and Canadian orchestras of works by contemporary composers as a means both of encouraging the issuance of commercial recordings and of making tapes available to conductors of other orchestras wishing to consider further performances. At the same time, the American Symphony Orchestra League developed a plan for a "World Music Bank" which would serve the same purpose of encouraging performance of new music by making available for use by conductors selected recordings and scores of new music from many countries.

The problems of the poet and the dramatist in obtaining a hearing are not too different from those of the composer. A grant in 1957 to the Young Men's and Young Women's Hebrew Association Poetry Center in New York will assist one of the country's most distinguished programs of poetry reading, as a similar program at San Francisco State College was assisted in 1956. The New Dramatists Committee in New York, for which assistance was renewed

this year, is a worthwhile effort to bring young playwrights into active association with theatre in America's most important dramatic center.

One of the most difficult questions of contemporary civilization is how we can make our ever-growing urban centers satisfying and stimulating places in which to live. One aspect of this problem is aesthetic, and yet there are few opportunities for its study, either in city or expanding suburb. In earlier years The Rockefeller Foundation supported studies of the cityscape at the Massachusetts Institute of Technology and of large-scale landscape planning at the University of Pennsylvania. In 1957 a grant was made to Yale University for work in the School of Architecture on the aesthetic problems of the rural-urban fringe.

#### SPECIAL PROJECTS

The decision to expand the activities of The Rockefeller Foundation in Asia, Africa, and Latin America led in 1957 to two projects of types which have not been a regular part of humanities activities during the past few years. English language teaching is an increasingly important problem for international intellectual and academic communication. The major grant to the University of California at Los Angeles for the development of a program in the teaching of English as a second language in the Philippines grew out of a recognition of the need for greater continuity and coordination of English language teaching activities than seemed feasible through the relatively scattered efforts of a variety of existing agencies.

While the program of The Rockefeller Foundation in the arts continues to be primarily concerned with the development of the arts in the United States, there have been some exceptional grants in other countries. In 1957 the Foundation was happy to be able to give support to enable

refugee Hungarian musicians to organize the Philharmonia Hungarica in Austria, a step which it is hoped will enable this competent and courageous group to find during 1958 a new base for further artistic development.

Turkey is rapidly becoming an important music center, a development which the Foundation has sought to encourage through the provision of better orchestral instruments not obtainable with Turkish funds.

## Intercultural Studies

DECCAN COLLEGE POSTGRADUATE AND  
RESEARCH INSTITUTE  
STUDIES OF INDIAN LANGUAGES

The numerous and diverse major languages spoken in India today are the subject of a large-scale training and descriptive study program being carried on at the Deccan College Postgraduate and Research Institute, Poona, India. Inaugurated in 1954, the project began as an organized effort to study the complex problems arising from the multiplicity of the major languages in the country, and involves questions of political and cultural unity, and of the future of education, science, and technology, as these are linked to language. A primary objective of the Deccan College program has been to train Indian linguists to make descriptive and comparative studies of the most important contemporary languages, and at the same time to develop effective research methods.

Over 400 scholars from all parts of India have already come to Poona to attend four linguistic schools offering intensive instruction. Future schools are planned in other regions of the country. Similar studies, modeled after the Deccan College program, are being undertaken by other uni-

versities and centers, and teaching and research are being developed on a coordinated and cooperative basis. In addition, American linguists are studying selected Indian languages to equip them for teaching and research.

The Rockefeller Foundation, which has supported the program since its inception, has continued its aid with a \$189,500 grant to provide up to 354,550 rupees and \$112,200 until the end of 1959.

#### ASSOCIATION FOR ASIAN STUDIES, INC.

##### COMMITTEE ON SOUTH ASIAN LANGUAGES

Since its organization in 1954, the Committee on South Asian Languages, now a subcommittee of the Association for Asian Studies, Inc., has advised Deccan College, Poona, India, on the development of linguistics and studies of the major contemporary languages of India. Through appropriations to Deccan College in support of its language program the Foundation contributed indirectly to the costs of this work. Now the Foundation has made two three-year grants totaling \$87,080 to the Association for Asian Studies, Inc., to enable the subcommittee to broaden the scope of its activities.

An appropriation of \$72,000 will finance a number of fellowships to be awarded to linguists from South Asia for study in the United States. The committee will make the awards and guide these scholars through appropriate courses of study.

A second appropriation of \$15,080 will make it possible for the committee to meet several times annually to develop plans for stimulating research and teaching in South Asian languages, for relating such efforts to other lines of study, and for cooperating with linguistic research programs in India, Pakistan, and neighboring countries.

Although the group will assume new responsibilities, it

will continue to advise Deccan College and other agencies concerned with the training of linguists for South Asia, promote the preparation of more adequate materials for learning languages, and carry on its other previous functions.

#### UNIVERSITY OF LONDON

##### SCHOOL OF ORIENTAL AND AFRICAN STUDIES

Since its organization in 1917, the School of Oriental and African Studies of the University of London, England, has become one of the world's leading centers for historical and allied studies of India, Pakistan, Ceylon, Burma, Malaya, and other countries of Southern Asia. Of particular value has been its location in London, through which it can offer its students access to the unrivaled collections of documentary sources on Southern Asia in London libraries, notably the India Office Library.

As part of a plan to give increased emphasis to Southern Asian studies, the school will annually during the next five years invite five younger historians from countries of the region to come to London for a year of intensive research and writing. To be selected by the school faculty with the assistance of senior Asian and Western scholars, the visiting historians will be free to select their own topics and approach while at the school. They are expected, however, to work individually on significant subjects and to take full advantage of cooperation with the school's faculty and with other visiting scholars.

The program as a whole is intended to be cumulative, and to emphasize analytical studies of important but neglected developments in the modern societies of Southern Asia. The investigations will be directed primarily to social, cultural, and economic processes and forces, and will be related to methods and findings in law, economics, languages, and other fields.

In 1957 The Rockefeller Foundation appropriated £55,125 (about \$157,100) to the University of London to help defray the costs of the visiting scholar program during a five-year period.

#### AMERICAN HISTORICAL ASSOCIATION

##### SOUTH ASIAN HISTORY

In recent decades there has been a steady advance in the United States in teaching and study of the history of East Asia, Latin America, and other foreign areas. However, corresponding historical work on South Asia has been slower to develop. To strengthen American scholarship in the field of South Asian history the American Historical Association has inaugurated a program under which it will invite historians of the area to teach and assist research in universities in the United States.

A Committee on South Asian History, organized by the association in 1956, will select scholars from South Asia and Great Britain to spend one- or two-year periods at a number of American universities. These scholars will help develop studies on South Asian history through programs of research, graduate training, and undergraduate instruction. The committee will place the historians from abroad at centers prepared to make the most of their knowledge and contributions. Younger as well as more mature scholars of established reputation will be invited to participate.

The program has been designed to help fill the need for a better understanding of the countries of South Asia through study of their history as well as to develop American academic work in the field. In support of the project, The Rockefeller Foundation has made a grant of \$140,000 to the American Historical Association, Washington, D.C., for use during the next five and one-half years.

**TOKYO UNIVERSITY****AMERICAN STUDIES**

The American studies program at Tokyo University, Japan, was originally established in 1950 through the joint efforts of Tokyo University and Stanford University, California, as a series of seminars held each summer through 1956. In offering studies not only of the United States but also of American work in such fields as economics, philosophy, history, and law, the program has made an important contribution to Japanese scholarship.

The university will now establish a Center of American Studies, incorporating into its regular curriculum courses in subjects that had been offered in the summer program. Under the new plan American professors will be invited to teach for six-month periods at the university, and Japanese scholars from other universities will study at Tokyo. Annual fellowship awards will continue to be given to Japanese scholars for study in America. In addition, the American students and to others as well, will continue to receive annual Studies Library, which is available both to Tokyo University additions. As in the past, Stanford University will assist Tokyo in recruiting American personnel.

The Rockefeller Foundation, which has contributed to the program's support since its inception, appropriated \$101,400 and 8,532,000 yen (about \$127,000) for use by the center during the next three years.

**SIXTH SECTION, ECOLE PRATIQUE DES HAUTES ETUDES****AREA STUDIES**

Organized in 1947 for research and training in history and the social sciences, the Sixth Section of the Ecole Pratique des Hautes Etudes, Paris, France, has since 1955 focused attention in these disciplines on studies of major

foreign areas—the Soviet Union, China, India, the Islamic world, and, most recently, Africa. In the last two years a number of new research posts have been established, and a series of volumes reporting the research results have been published or are now in press. Among the important features of the Sixth Section's program are the faculty's concern with group and interdisciplinary research and with contemporary problems, and the participation of scholars from other institutions in Paris.

In the next few years the section plans to stress consolidation and interpretation of research findings on Russia and China, on which much work has been done, and to emphasize research training and field investigations in Indian, Islamic, and African studies. The school will send younger French scholars abroad for study, finance research visits to other countries by senior scholars, and invite foreign scholars to Paris for teaching and research. A Rockefeller Foundation grant of \$80,000 will help support these activities during a three-year period.

#### UNIVERSITY OF CALIFORNIA

#### MANUAL ON ISLAMIC CIVILIZATION

In their efforts to develop studies of Islamic history and culture, scholars and teachers in the United States have been handicapped by the lack of an adequate textbook on Islamic civilization. To help fill this need, Professor Gustave E. von Grunebaum has planned the preparation of a manual covering the entire geographical scope of Islam.

The manual will be supplemented by additional volumes of maps, bibliographies, and relevant source material in translation. Dr. von Grunebaum will direct the work with the assistance of Professor Marshall G. S. Hodgson of the University of Chicago and the guidance of an advisory committee of distinguished Islamicists.

A Rockefeller Foundation grant of \$32,000 to the University of California, Los Angeles, where Dr. von Grunebaum directs the Near Eastern Center, will help finance the project during a three-year period.

#### UNIVERSITY OF HAWAII

##### PACIFIC ISLAND AREAS

Because of its geographical location, the University of Hawaii has long been interested in research on Micronesia, Polynesia, and parts of Melanesia. Some of its students come from these areas, and its concern with the Pacific Islands has been further stimulated by the fact that the Hawaiian Islands' economic interests are closely allied with those of the region. In its administration of the trust territories, the United States has frequently called upon University of Hawaii professors for assistance.

To help the University of Hawaii library acquire research materials on the Pacific Island areas, the Foundation during 1957 appropriated \$30,000 for use over a five-year period.

#### OTHER GRANTS

##### Stanford University, Palo Alto, California:

Studies of the history of the Turkish Revolution, by Professor Enver Ziya Karal, University of Ankara, Turkey, and Frederick P. Latimer, Jr., Princeton University, New Jersey; \$20,000;

Professor Jin'ichi Konishi, Department of Literature, Tokyo University of Education, Japan; to spend a year at Stanford; \$5,000;

Continued study of Japanese poetry, by Dr. Robert H. Brower, Stanford University, and Dr. Earl Roy Miner, University of California at Los Angeles; \$4,500;

Additional expenses of a conference on the utilization of the collection of the Hoover Institute and Library in research on the history of modern Turkey; \$475;

University of London, School of Oriental and African Studies, England:

A conference on historical writing on the Middle East, held during the summer of 1958 under the direction of Professor Bernard Lewis; \$19,720;

Professor and Mrs. C. H. Philips; to visit the United States to observe studies of Africa and Asia at selected universities; \$5,275;

Professor W. G. Beasley, professor of the history of the Far East, and Mrs. Beasley; to visit university centers of Far Eastern studies in the United States; \$2,300;

University of Rangoon, Burma: books and materials on modern Asia; \$18,000 for a two-year period;

Broadcasting Foundation of America, Inc., New York: an international exchange program of cultural materials for radio and television broadcasting; \$12,250;

Elmira College, New York: study in Turkey of contemporary Turkish life, by Dr. Mack B. Swearingen; \$10,000;

Middlebury College, Vermont: new courses on present-day Russian language in science, technology, and other fields for the Russian Summer School; \$10,000;

Harvard University, Cambridge, Massachusetts:

Analytical study of Soviet policies in the Middle East after 1917, by Walter Z. Laqueur; \$9,000;

Professor Toshio Kawatake, instructor, Department of Drama, Waseda University, Tokyo, Japan, and a visiting scholar, Harvard-Yenching Institute; to study the American theatre; \$500;

University of the Ryukyus Foundation, Shuri City, Okinawa: to appoint a professor of Chinese culture and civilization; \$8,300;

University of Texas, Austin: expenses of Latin American participation in the Second International Congress of Mexican-United States Historians, to be held during November, 1958; \$6,850;

Dr. Constantine K. Zurayk, vice-president, American University of Beirut, Lebanon, and Mrs. Zurayk: to visit centers of Middle Eastern studies in Europe; \$5,750;

Dr. Yi Pyeng Do, historian and dean, Graduate School, Seoul National University, Korea: to visit centers of Far Eastern studies in the United States; \$5,600;

Professor Tsutomu Ueda, General Education Faculty, Tokyo University, Japan: to study in the United States and Europe; \$5,600;

Dr. Robert Brunschvig, professor of Islamics, University of Paris, France, and Mrs. Brunschvig: to visit Turkey to gain a direct acquaintance with Islam in Turkey; \$5,500;

University of Oxford, St. Antony's College, England: continued development of Near Eastern studies, under the direction of Frank Stoakes; £1,600 (about \$4,800);

University of Ceylon, Peradeniya: development of a program in American history through acquisition of books and documentary materials and of the services as visiting professor of Dr. David F. Long, associate professor of American history, University of New Hampshire, Durham; \$4,750;

American University at Cairo, Egypt: to provide an assistant for Professor K. A. C. Creswell in his studies of Moslem art and architecture; \$4,450;

Gadjah Mada University, Djogjakarta, Indonesia:

Professor P. J. Zoetmulder, secretary, Faculty of Letters and Culture; to visit centers of Asian studies in North America and Europe; \$3,675;

Books on history and Western literature; \$1,200;

University of Chicago, Illinois:

Research in Indian cultural history, by Dr. J. A. B. van Buitenen; \$3,500;

Documentary materials on Bengal for use in studies of that region of Southern Asia; \$3,000;

A conference on the preparation of materials for use in undergraduate courses on Islam; \$2,750;

Southern California School of Theology, Claremont: study in Japan of Japanese religions, by Floyd H. Ross, professor of world religions; \$3,194;

University College of Wales, Aberystwyth: books and materials on American studies; \$3,000;

University of Minnesota, Minneapolis: informal conferences to develop new approaches to the study of Indian philosophy; \$3,000;

A. C. Scott, specialist in Oriental drama, Hong Kong: to visit Japan to study Japanese theatre; \$2,500;

Columbia University, New York:

Continuation and completion of a book on language planning problems in multilingual countries, by Dr. Uriel Weinreich; \$2,375;

Completion of a study on problems of linguistic policies, under the direction of Professor John Lotz, director, Language and Communication Research Center; \$1,265;

Miss Madeleine David, associate director, Cernuschi Museum, Paris, France: to study collections of Oriental art in the United States; \$2,250;

Professor F. Delor M. Angeles, Silliman University, Dumaguete, Philippines: to visit Indonesia to study the Indonesian language and culture; \$2,000;

John O. McCormick, professor of American studies, Free University of Berlin, Germany: to continue a study of Roman Catholic thought in American intellectual history; \$1,300;

Hanazono College of Zen, Kyoto, Japan: books and other materials in connection with the service as visiting lecturer at Harvard University, Cambridge, Massachusetts, of Professor Shinichi Hisamatsu; \$1,000;

Dr. Lloyd S. Woodburne, dean, College of Arts and Sciences, and Professor George E. Taylor, director, Far Eastern and Russian Institute, University of Washington, Seattle: to visit Stanford University, Palo Alto, California, and the University of Michigan, Ann Arbor, for discussions of problems related to American studies abroad; \$810;

Kyoto University, Japan: for microfilming Russian language materials in the field of Russian political philosophy; \$525;

Ministry of Education, Vienna, Austria: Dr. Richard G. Plaschka, secretary, Institute for East European Research; to visit European centers of East European studies; \$500.

## Humanistic Research

### FREE UNIVERSITY OF BERLIN, UNIVERSITY OF FRIBOURG, AND THE INTERNATIONAL INSTITUTE FOR SOCIAL HISTORY

#### STUDIES OF MARXISM-LENINISM

The philosophy of Karl Marx has become, in its Leninist version, the official philosophy of all Communist governments and parties, and, through a separate line of development, the foundation of thought for many Socialist and labor groups that are frequently effective opponents of Communism. It is important that it be understood in the West in both contexts.

The Foundation in 1957 made three-year appropriations of \$31,700 to the Free University of Berlin, Germany, of \$20,000 to the University of Fribourg, Switzerland, and of \$20,000 to the International Institute for Social History, Amsterdam, the Netherlands, toward the costs of three independent but correlated studies of Marxism-Leninism.

The East Europe Institute of the Free University will direct research on pre- and post-Leninist Marxism to be

undertaken in Germany, and arrange two international conferences in this field. The Institute of Eastern Studies at the University of Fribourg, under the direction of Professor J. M. Bochenski, will conduct research on Leninist philosophy in Poland and in Czechoslovakia since 1945, Socialist realism since Zhdanov, trends in Leninism in the Arab states, and similar studies.

The International Institute for Social History, a research library with collections of material on Marxism, Leninism, and the labor movement unequaled outside the Soviet Union, will utilize its grant to make these collections more accessible to scholars in the Netherlands and abroad. The institute's own interest in Marxism relates primarily to the period prior to World War I, but its resources are essential as a sound basis for work on other periods, including the most contemporary.

#### COLUMBIA UNIVERSITY

#### HAMILTON PAPERS

Since 1954 Columbia University, New York, has been working on a new edition of the papers of Alexander Hamilton, first Secretary of the Treasury, whose frequently farsighted views on the role of government, and the relation of economic issues to politics and statecraft, are often helpful in illuminating similar questions today. The new edition, already well under way, will include considerable material never before published, and will provide the critical annotations needed to link Hamilton's writings with the events that called them forth. Among the papers to be published for the first time are correspondence, memoranda, and briefs relating to Hamilton's long and active law practice in New York which legal scholars hope will assist them to a deeper understanding of the development of American law and particularly of commercial law.

The Rockefeller Foundation joined with the Columbia University Press and with Time, Inc., in 1954 in providing the funds necessary to initiate work on the Hamilton papers. A new grant of \$50,000 will carry Foundation support through the period ending June 30, 1960.

#### KOKUGAKUIN UNIVERSITY

#### INSTITUTE FOR JAPANESE CULTURE AND CLASSICS

Kokugakuin University, a privately supported university affiliated with Shrine Shinto, the ancient ancestral religion of Japan, has maintained since 1955 an Institute for Japanese Culture and Classics devoted to study of Japan's cultural and religious traditions. Among the institute's projects are editing and translation of classic texts, study of the religious content of festivals and of rice cultivation, analysis of modern Shinto thought, and study of the differences in interpretation of Shinto by Japanese and non-Japanese writers.

In 1957 The Rockefeller Foundation appropriated 12,962,000 yen and \$7,500 (about \$46,400) to Kokugakuin University, Tokyo, to help support the institute's research program during the next three years. The Foundation has previously aided the development of a library of comparative religion and philosophy at the institute, and the training abroad of members of the university's staff.

#### EL COLEGIO DE MEXICO

#### LITERARY STUDIES

An important center for advanced training in the humanities, the Colegio de México, Mexico City, has long given primary emphasis to literary studies and, since 1947, has sponsored the *Nueva Revista de Filología Hispánica*, the most respected journal of its kind published in Latin

America. To strengthen literary studies in Mexico and to help train younger scholars, the college has now instituted a new program of advanced training and research.

The college plans to invite a younger professor of philology in a Spanish university to spend three years in Mexico City directing the work, and each year to bring one or two senior professors to the college for shorter periods. Research grants for three younger scholars who have completed their formal training, and fellowships for eight to ten graduate students, will be awarded annually. The expenses of the program will be partially met by a three-year grant of \$39,000 from The Rockefeller Foundation.

#### NATIONAL INSTITUTE OF ECONOMIC

#### AND SOCIAL RESEARCH

#### ALEXIS DE TOCQUEVILLE PAPERS

Four titles in a new edition of the writings of Alexis de Tocqueville have been published, including *De la Démocratie en Amérique*, *L'Ancien Régime et la Révolution*, and most recently *Correspondence Anglaise* (1954) and *Voyages* (1957). The edition is being edited by a scholar, Mr. J. P. Mayer, under the general direction of a commission set up by the French government.

More than three-quarters of eight further volumes now being prepared for the press will consist of hitherto unpublished material. De Tocqueville's correspondence with his wife and with various French diplomats, and two volumes of political speeches and documents are among the papers still to appear.

Since 1949 the Foundation has appropriated \$34,500 to the National Institute of Economic and Social Research in London in support of Mr. Mayer's work, and in 1957 made a further grant of \$27,500 to the institute, available through the next five years.

## OTHER GRANTS

## Colegio de México, Mexico City:

Research on contemporary Mexican history; \$18,300 for a two-year period;

Professor and Mrs. Daniel Cosío Villegas; to visit European centers of Latin American studies and to observe and lecture in Asia; \$9,000;

University of Puerto Rico, Río Piedras: research on the philosophical system of José Ortega y Gasset, by Professor Julián Marías; \$17,000 for a three-year period;

University of Oxford, St. Antony's College, England: research on the history of the Reformation in Poland and Lithuania, by Dr. Stanislas Kot; \$15,000 for a two-year period;

## Harvard University, Cambridge, Massachusetts:

Research and writing on Russian history, by Professor Michael Karpovich; \$12,000 for a two-year period;

Continued study in connection with a history of the Bauhaus, by Dr. Hans Maria Wingler, art critic and writer; \$2,150;

Consultation with Bertrand, Earl Russell, concerning a book on Anglo-Saxon philosophy in recent decades, by Dr. Hiram J. McLendon, assistant professor of philosophy; \$1,865;

University of London, Institute of Historical Research, England: studies related to parliamentary history, under the direction of Sir Lewis Namier; £4,000 (about \$11,400) for a four-year period;

## University of Chicago, Illinois:

Continuation of studies of the life of the Marquis de Lafayette, by Professor Louis Gottschalk; \$11,000 for a two-year period;

Professor Alan Gewirth, Philosophy Department; to study political philosophy and ethics in Great Britain and on the Continent; \$9,950;

University of Alabama, University: study of the function and structure of law in a democratic society, by Professor Iredell Jenkins, chairman, Philosophy Department; \$9,967;

Amherst College, Massachusetts: completion of a book on John Dewey's social and ethical philosophy, by Professor Gail Kennedy, chairman, Philosophy Department; \$9,800;

University of Chile, Santiago:

Studies of the social and economic history of colonial Chile, by Alvaro Jara Hantke and Rolando Mellafe Rojas; \$9,600;

Preparation of a general historiography of Hispanic America, by Professor Eugenio Pereira Salas; \$6,850;

Columbia University, New York:

Preparation of a book on the philosophy of science, by Professor Ernest Nagel, Department of Philosophy; \$9,000;

Preparation of a book on the history of Islam in the subcontinent of India, by Professor I. H. Qureshi; \$7,500;

Dr. Zeki Velide Togan, professor of Turkish history, Faculty of Letters, University of Istanbul, Turkey; research in the Near and Middle East Institute; \$6,000;

Professor Hugo Hantsch and Dr. Fritz Fellner, University of Vienna, Austria: to visit centers of historical study in the United States and Europe in connection with a history of the later phases of the Austro-Hungarian Empire; \$6,000;

Waseda University, Tokyo, Japan: research on the impact of the Japanese military administration on the Indonesian independence movement, under the direction of Shigetada Nishijima; \$5,660;

Northwestern University, Evanston, Illinois: research in Great Britain on President Woodrow Wilson's neutrality policy, by Professor Arthur S. Link; \$5,500;

Academy of American Franciscan History, Washington, D.C.: a conference on the history of religion in the Americas, to be held in cooperation with the Commission on History, Pan American Institute of Geography and History, Mexico City, Mexico; \$4,925;

The Trustees of Robert College, Istanbul, Turkey: studies of the history of the college, by Keith M. Greenwood, professor of history; \$4,350;

Dr. Frederick Broadie, lecturer, Department of Moral Philosophy, University of Edinburgh, Scotland: to visit centers of philosophy and the social sciences in the United States; \$4,000;

Professor Abraham J. Sachs, Brown University, Providence, Rhode Island: to complete a study of Babylonian texts in the British Museum, London, England; \$3,000;

Free University of Berlin, East Europe Institute, Germany: a second conference of Western scholars on problems connected with a critical appraisal of Marxist philosophy; \$3,000;

Institute on Religion in an Age of Science, Boston, Massachusetts: expenses of participants and lecturers at the institute's 1957 summer conference; \$3,000;

Royal Asiatic Society, London, England: preparation of a book on Robert de Nobili, by Vincent Cronin; \$1,800;

Laval University, Quebec, Canada: studies in French-Canadian folklore, by Professor Luc Lacourcière; \$1,400;

University of Delhi, India: continuation of philosophical research on the formulation of a theory of value, by A. S. Ayyub; 6,250 rupees (about \$1,325);

College of Higher Education, Pisa, Italy:

Dr. Mario Corsi, assistant professor of philosophy; to visit centers of philosophical research in the United States; \$1,078;

Books, periodicals, and other materials on American philosophy; \$1,000.

## The Arts

### LINCOLN CENTER FOR THE PERFORMING ARTS, INC.

The concept of a center for the performing arts in New York City originated in 1955 as a result of the Metropolitan Opera Association's need for larger and more mod-

ern facilities, of the scheduled demolition of Carnegie Hall upon the termination in 1959 of the Philharmonic-Symphony Society's lease, and of the expressed willingness of New York City to make available an 11-acre site as part of the redevelopment of the Lincoln Square area. The exploratory committee formed by the Metropolitan and the Philharmonic decided that any new center should include provision for all the performing arts and for related educational activities, and formulated plans for a complex of buildings to be constructed west of Ninth Avenue between 62nd and 65th Streets. The sum of \$75,000,000 is being sought to provide land, buildings, and a fund for educational and creative purposes.

The essential buildings of the Center include an opera house, a concert hall, ballet and repertory theatres, an educational building to house the Juilliard School, certain smaller theatres, and a library-museum building. The Center will provide a home for a major company in each of the performing arts and, in addition, will offer its facilities to leading groups from the United States and abroad at times or seasons not required by the home companies. Year-round operation of the Center will provide more favorably for New York appearances by both the Center's constituent members, such as the Metropolitan Opera and the Philharmonic, and other deserving organizations, American and international. The artistic, administrative, and financial autonomy of all performing organizations using its facilities is basic to the concept of the Center.

The advance of the performing arts throughout the United States is impressive and encouraging. In New York City, traditionally a national center in the arts, the new Lincoln Center will provide a unique opportunity to present the performing arts, at their best and in a setting worthy of them, to the greatest number of people. Year-round operation of the Center, possible with the support of New York's

resident and transient population, will give American and other performing organizations new opportunities to appear before audiences and critics appreciative of their offerings. At the same time, the Center's varied facilities will permit American audiences to see, hear, and enjoy a wider range of presentations in the performing arts than is now possible in New York.

The concept of the Center is unique in several other respects. For the first time organizations concerned with the performing arts will have a choice of the house most appropriate for a given production. An opera company, for example, will no longer need to limit its repertory to works that can be produced in a house designed for traditional grand opera; alternatives at the Center will be the smaller ballet or repertory theatres, or even the more intimate theatres to be built. In addition, through the participation of the Juilliard School, advanced study in music, dance, and drama will have a functional relationship with performance of the highest standards. The possibilities of this relationship for professional development are unprecedented in the United States.

Toward the funds needed for the Lincoln Center for the Performing Arts, The Rockefeller Foundation has contributed a total of \$10,050,000. The first grant, made in 1956, provided \$50,000 toward the costs of planning, and a second 1956 grant of \$2,500,000, together with an equal sum from the Ford Foundation, assured funds for the purchase of the land.

. The third Rockefeller Foundation appropriation of \$7,500,000 will provide \$5,000,000 toward construction of the Center, contingent upon the Center's raising from other sources not less than \$40,000,000, in addition to the funds for the site and the participation of New York City—terms which underscore the importance of the realization of the plan as a whole. When construction of the buildings

is assured, the balance of the grant will immediately provide \$2,500,000 toward a \$14,000,000 fund for educational activities, scholarships, and artistic development in music, dance, and drama, thereby enabling the Center to utilize its new facilities to best advantage without delay.

The grants made by The Rockefeller Foundation to Lincoln Center constitute its contribution to a venture which represents American belief in the importance and lasting value of the arts. This belief is reaffirmed in the substantial support given by New York City and the federal government in making the site available for a cultural development in connection with a major slum clearance project. Supplementary support to the project from the city includes plans for a public park and garage, and street, subway, and highway changes to give ready access to the Center to all in the metropolitan area.

#### YALE UNIVERSITY

#### GRADUATE PROGRAM IN CITY PLANNING

More than 40 per cent of the estimated population increase of the nation in recent years has occurred in the urban-rural fringe—the population centers along the highways and the sprawling, low-density areas between and around the great cities. The residential and commercial buildings and other facilities hurriedly assembled to meet this population growth too often reflect scant attention to good design or sound planning, with the result that roadside slums and other eyesores are multiplying at an alarming rate.

Following five years of research and publication on city planning, scholars in the Graduate Program in City Planning at Yale University are beginning a three-year study of problems of aesthetic design in the suburbs. Typical rural-

urban fringe sections in the northeastern states will be surveyed to determine what is happening to them in an architectural sense and to estimate the social and economic factors relevant in planning for them. Subsequently better designs will be projected and standards of appearance evolved for a variety of familiar townscapes, and such techniques to accomplish better-looking communities as legislation or public education will be explored. To assist these investigations, The Rockefeller Foundation has appropriated \$67,600 to Yale University, New Haven, Connecticut.

#### LIBRARY OF CONGRESS

##### RESEARCH ON SOUND RECORDINGS

Sound recordings are an important part of the collections of all research libraries and major archives. For these institutions, and for many smaller organizations and individuals, the deterioration of recordings in storage is a major problem, and one which becomes more acute with the increasing use of sensitive but highly perishable recording material.

Currently the Library of Congress is sponsoring research to determine the most suitable techniques for the long-term storage of disc and magnetic tape recordings. The library seeks a storage method which will maximize the shelf life of records without an undue loss of shelf availability or an excessive increase in storage cost.

The Music Division of the library, which has custody of its record collection, continually receives requests for information on storage techniques from other institutions here and abroad. For this reason it is in an excellent position to disseminate information obtained in the study. Toward the costs of the program and the publication of the results, the Foundation has made a two-year grant of \$65,000 to the Library of Congress, Washington, D.C.

## NEW DRAMATISTS COMMITTEE, INC.

In 1949 a number of distinguished playwrights and others prominent in the theatrical world organized the New Dramatists Committee, Inc., New York, as a means of offering encouragement and advanced training to promising playwrights not yet established in the profession. The committee's activities have been twofold: it has enabled its members to see Broadway plays in the various stages of rehearsal and actual performance and to discuss them with the author and others involved; and it has arranged for reading, discussion, and occasional experimental production of plays by members.

The committee now plans to institute an expanded program under which approximately ten promising playwrights will observe the progress of a play in its successive stages of first reading, out-of-town production, and New York opening, and participate in a new series of biweekly discussions of great plays of the past. A Rockefeller Foundation grant of \$54,000, available through the period ending June 30, 1961, will provide funds for the program.

## NEW YORK PRO MUSICA ANTIQUA, INC.

The New York Pro Musica Antiqua was organized in 1953 to perform Western music, both vocal and instrumental, composed before 1700, an activity which has frequently required the editing and virtual recreation of music from unpublished sources and rudimentary notations, the assembling and reconstruction of authentic instruments, and the rigorous training of both vocalists and instrumentalists in the exacting standards of public performance. The group has now achieved national status, and consistently receives more invitations to give concerts than it can accept. Music presented by the Pro Musica Antiqua has been published,

recorded, and performed on nation-wide television broadcasts.

To enable the Pro Musica Antiqua to broaden its national coverage and to establish itself more securely as a performing organization concerned with a little-known body of important music, The Rockefeller Foundation in 1957 appropriated \$46,000, available during the period ending May 31, 1962.

#### PILGRIM PLAYERS, LIMITED

##### RELIGIOUS DRAMA

In the present revival of interest in the religious tradition of drama, the Religious Drama Society of Great Britain and its acting company, the Pilgrim Players, Limited, have played a highly influential role. In addition to encouraging the performance of earlier religious dramas, the society has sponsored the performance of such plays as T. S. Eliot's *Murder in the Cathedral* and commissioned Christopher Fry's *A Sleep of Prisoners*. Through its tours, the Pilgrim Players company have extended the society's activities throughout the United Kingdom.

To assist the Religious Drama Society with its international activities during the next five years, including a conference on religious drama to be held in Switzerland during 1960, the exchange of religious drama companies between England and other countries, and the international section of the society's periodical, *Christian Drama*, the Foundation during 1957 appropriated £10,300 (about \$30,000) to the Pilgrim Players, Limited.

#### AMERICAN INTERNATIONAL MUSIC FUND, INC.

To encourage greater public knowledge and appreciation of contemporary music, the American International Music Fund, Inc., New York, has added a new activity to

its program. The fund will first arrange to have tape recordings made of the performance by major American and Canadian orchestras of unrecorded works by living composers, and will then appoint a jury of eminent musicians to select two for release by a commercial recording company. All the tapes made will be placed on deposit in the music divisions of the New York Public Library and four other libraries throughout the country, where they will be available to conductors considering further performances of the works by their orchestras.

A Rockefeller Foundation grant of \$27,000 will help finance the fund's new project during the 1957-1958 concert season.

YOUNG MEN'S AND YOUNG WOMEN'S  
HEBREW ASSOCIATION  
NEW YORK POETRY CENTER

For more than 20 years the YM-YWHA at Lexington Avenue and 92nd Street in New York City has sponsored successful chamber music concerts, plays, presentations of the dance, and other activities in the arts. During this period the program providing for readings of contemporary poetry by poets has done much to increase public interest in the work of such authors as W. H. Auden, T. S. Eliot, Robert Frost, and the late Dylan Thomas.

Toward the expenses of the New York Poetry Center through the next three years, the Foundation has appropriated \$20,600, including an outright grant of \$5,000 for use as working capital, to this branch of the Young Men's and Young Women's Hebrew Association.

OTHER GRANTS

National Conservatory of Ankara, Turkey: studies of music education in Europe, the United States, and Canada, by Fuad Turkay, director; \$10,800;

Brooklyn Museum, New York: preparation of a book on prints of the twentieth century, by Miss Una E. Johnson, curator of prints and drawings; \$10,000;

Walker Art Center, Minneapolis, Minnesota: an experimental program to stimulate the purchase and rental of works of art; \$10,000;

American Symphony Orchestra League, Inc., Charleston, West Virginia: to encourage the performance internationally of contemporary orchestral music; \$9,768;

Bagong Kussudiardjo, Indonesian dancer and choreographer: to study dance forms in the United States and other countries; \$7,425;

Westminster Choir College, Princeton, New Jersey: preparation of a selected bibliography of choral music; \$7,000;

*Partisan Review*, New York:

William Phillips, editor; to visit Europe and the Far East to obtain a direct acquaintance with writers, editors, publishers, and the cultural scene; \$6,600;

Philip Rahv, editor; to visit Europe to obtain a direct acquaintance with writers, editors, publishers, and the cultural scene; \$3,400;

Wisnuwardhana, Indonesian dancer and choreographer: to study dance forms in the United States and other countries; \$6,550;

Professor N. V. M. Gonzalez, University of the Philippines, Quezon City, and Mrs. Gonzalez: to spend a year writing and to visit Japan, Korea, and Formosa; 6,355 Philippine pesos and \$3,200 (about \$6,375);

Professor Kenneth Macgowan, retired chairman, Department of Theatre Arts, University of California, Los Angeles, and Mrs. Macgowan: to visit Turkey for consultation on the development of the theatre in Turkey; \$6,350;

Laurence S. Harrison, consulting engineer and specialist in museum lighting, New York, and Mrs. Harrison: to advise the Government of India on problems related to the Central National Museum, Delhi; \$6,250;

University College of the West Indies, Mona, Jamaica:

Technical assistance to the first Caribbean Festival of Arts; \$6,030;

Consultations in the United States and Canada concerning plans for a dramatic festival to be held in Port-of-Spain, Trinidad, during 1958, by Noel Vaz and Errol Hill, drama tutors, and Derek Wolcott, playwright; \$2,000;

University of Wisconsin, Madison: study of the development of community theatres in the United States and Canada, by Professor Robert E. Gard; \$6,000;

Hernan Díaz-Arrieta, critic, Santiago, Chile: to visit the United States to prepare for publication and microfilming manuscripts of the late Gabriela Mistral, Nobel laureate; \$5,850;

S. H. Vatsyayan, writer and editor, New Delhi, India: to study literary and cultural trends in the countries of East and Southern Asia; \$5,700;

Jacob's Pillow Dance Festival, Inc., Lee, Massachusetts: scholarship assistance during the summer of 1957; \$5,000;

University of Dacca, Pakistan: critical studies of contemporary Bengali literature; \$3,700;

Robert E. Seaver, director-elect, Religious Drama Program, Union Theological Seminary, New York: to visit centers of religious drama in Europe; \$3,500;

Professor Jose Maceda, Music Department, Philippine Women's University, Manila: to visit European centers of comparative music and electronic music; \$3,400;

Baylor University, Waco, Texas: to appoint Ramsey Yelvington as playwright in residence at the Baylor Theatre; \$3,000;

Starr King School for the Ministry, Berkeley, California: development of a collection of religious art prints and organization of a print lending service; \$2,250;

Tokyo University of Arts, Japan: provision on microfilm of Western music scores; \$1,600;

Professor Soji Inoue, chairman, Department of English, Wakayama University, Japan: to visit Europe to observe British and European drama en route from the United States to Japan; \$1,590;

Mrs. H. Fureya Koral, ceramist, Istanbul, Turkey: to observe work in ceramics in the United States; \$1,500;

Professor G. W. Woodworth, Department of Music, Harvard University, Cambridge, Massachusetts: to observe the work of choral groups in the United States; \$1,500;

National Institute of Anthropology and History, Mexico City, Mexico: to invite an art restorer from the United States to direct the restoration of four recently discovered pre-Cortesian mosaics; \$1,325;

George E. Judd, Sr., former manager of the Boston Symphony Orchestra, and Mrs. Judd, New York: to study the financing of American symphony orchestras; \$1,200;

Zainul Abedin, principal, Government Institute of Arts, Dacca, Pakistan: to visit centers of artistic activity in the United States and Europe, and to purchase art supplies and books; \$935;

R. K. Narayan, novelist, Mysore City, India: to meet writers, critics, and publishers in Great Britain, Western Europe, and the United States; \$765;

Thomas George, American woodblock print artist, Kyoto, Japan: to visit Korea and Okinawa to exchange with the artists of these countries information on Japanese and American print-making techniques; \$700;

Mrs. E. Morris Cox, chairman, Rental Gallery School Program of the Women's Board, San Francisco Museum of Art, California: to observe art lending programs in Chicago and Pittsburgh; \$600;

Dr. Narayana Menon, director, All-India Radio, Madras: to visit the United States, Canada, and Europe to study the relationships between Indian and Western music; \$450;

University of Michigan, Ann Arbor: additional expenses of a visit to the United States by Yuzo Yamamoto, Japanese writer; \$400.

## Special Projects

### UNIVERSITY OF CALIFORNIA

#### ENGLISH LANGUAGE TEACHING

In the Philippines, a multilingual country, the problem of language instruction has special relevance. Under recent educational policy directives, Tagalog, the national language, and English are to be introduced as subjects in the first and second grades while the local tongue is to be used in teaching at these levels in all public and private schools. In the higher grades English continues to be used as the language of teaching and maintenance of high standards in its use is essential to all educational activities.

In the light of this situation, a program to assist in the improvement of methods of teaching English as a second language in the Philippines is being established by the University of California, Los Angeles, under the direction of Professor Clifford H. Prator. The project is to function as a two-part program in California and in the Philippines. At Los Angeles, a special course will be offered on the teaching of English as a second language with relation to Philippine needs. In Manila, an office of research on language instruction is being set up to explore problems of language teaching, provide technical advice for teacher training programs, and develop new teaching materials for schools. A Filipino director and an American codirector will work at the Manila office with technical and consultant staff from both countries. An advisory board, headed by the Philippine Secretary of Education, will assist the Manila office.

In support of the program, The Rockefeller Foundation has made available \$684,400 over five years.

UNIVERSITY OF TEXAS  
TRAINING IN LINGUISTICS

English is taught as the principal second language at all educational levels in Egypt. By the best available estimates some 450,000 students enrolled in the preparatory and secondary schools are now engaged in studying it.

In Egypt, as in all the Arabic-speaking nations, a considerable portion of the population finds mastery of a second language a real desideratum. English has served as a second language for large numbers of Egyptians, and the Egyptian Ministry of Education is placing special emphasis on strengthening the methods of teaching English in schools.

As part of the program the ministry is sending selected teachers of English abroad for advanced work in general linguistics at English-speaking universities. These trainees will return home, to posts in the ministry or on the faculties of teacher-training colleges, better equipped to do some of the theoretical spade-work necessary before practical improvements in the methods of teaching any language can be made. Toward the expenses of three of the Egyptian scholars, who will spend four years at the University of Texas, the Foundation has made a four-year grant of \$71,000 to the university.

CONGRESS FOR CULTURAL FREEDOM  
PHILHARMONIA HUNGARICA

Early in 1957 refugee Hungarian musicians and performing artists in Vienna, Austria, formed the Philharmonia Hungarica under the sponsorship of the Congress for Cultural Freedom and with the financial assistance of The Rockefeller Foundation. In its performances during the spring, the group gave evidence of its high musical standards

and was enthusiastically received by the audience and acclaimed by the Vienna critics.

During the coming year the Philharmonia Hungarica plans to establish its basic repertory and further consolidate its position as a performing unit under the general direction of Antal Dorati, Hungarian-born conductor of the Minneapolis, Minnesota, Symphony Orchestra. A new Foundation grant of \$40,000 to the congress, Paris, France, will contribute toward support of the orchestra during the year beginning October 1, 1957.

#### ISTANBUL MUNICIPAL CONSERVATORY

In the thirty years since the establishment of the Republic, Turkey has developed both keen interest and real proficiency in Western music. The country now supports two orchestras, two conservatories, and a national opera company, and a number of its musicians and composers have achieved international eminence.

The symphony orchestra of Istanbul, a section of the Istanbul Municipal Conservatory, also serves as the orchestra of the Istanbul Radio and gives concerts—some of them under the auspices of the Philharmonic Society, a private organization—to capacity audiences. To enable the orchestra to acquire instruments and musical supplies outside Turkey, at a time when importations are necessarily restricted, The Rockefeller Foundation has appropriated \$40,000 to the Istanbul Municipal Conservatory.

#### OTHER GRANTS

University of Edinburgh, Scotland:

Support of its English language teaching program; \$16,500 for a two-and-a-half-year period;

David Abercrombie, head, Department of Phonetics; to visit the United States to study methods for the teaching of English; \$1,750;

Australian Humanities Research Council, Adelaide: a survey of the state and prospects of the humanities in Australia; 7,000 Australian pounds (about \$15,820);

Mexican-American Cultural Institute, Mexico City:

Production of phonograph records to accompany English language instruction; \$12,000;

A survey of English teaching in the Republic of Mexico; \$8,500;

American Council of Learned Societies, Washington, D.C.: continuation of its program of Summer Study Aids in Linguistics; \$10,000;

University of Michigan, Ann Arbor: to invite to the United States for consultation two Egyptian specialists in the teaching of English, and to provide books and equipment for study of linguistics at the University of Cairo; \$8,650;

Brown University, Providence, Rhode Island: continued study of the improvement of English language instruction in Egypt, by Professor W. Freeman Twaddell; \$8,594;

Kakuzaemon Nunokawa, manager, Japan Federation of Publishers' Associations, Tokyo: to visit the United States and Europe; \$6,200;

American University of Beirut, Lebanon:

Dr. Curtis B. Watson, associate professor of English; to study general education in the United States; \$6,000;

Farid A. Fuleihan, registrar, and Mrs. Fuleihan; to study, principally in the United States, the functions of college and university registrars; \$3,400;

Fuad Sarruf, vice-president; to study the public relations policies of universities in the United States; \$2,500;

Dr. Tio Tjiong Tho, legal expert, Ministry of Justice, Djakarta, Indonesia: to study in North America and Europe the legal status of non-profit institutions; \$5,550;

American Council for Emigrés in the Professions, Inc., New York: to provide interim living expenses for Jozsef Domjan, refugee Hungarian artist, and his family; \$5,400;

American National Theatre and Academy, Inc., New York:

To provide interim expenses for Arpad Darazs, Hungarian refugee, and his family; \$5,400;

To provide interim expenses for Michael Honvary and his wife, Zsuzsa Cserhat, Hungarian refugees; \$4,400;

To provide interim expenses for Sandor Szabo and his wife, Kato Barsczy, Hungarian refugees; \$4,400;

To provide interim expenses for Mr. and Mrs. Miklos Benzce, Hungarian refugees; \$4,200;

To provide interim expenses for Aladar Majorossy, Hungarian refugee composer and conductor; \$3,100;

Dr. Kakuichi Oshima, president, Doshisha University, Kyoto, Japan: to visit educational institutions in Europe and North America; \$5,150;

Hebrew University, Jerusalem, Israel: Dr. Curt Wormann, director, The Jewish National and University Library; to visit American libraries and library schools; \$5,000;

Samuel Mathai, secretary, University Grants Commission, New Delhi, India: to visit selected universities and educational agencies in the United States; \$4,230;

D. C. Pavate, vice-chancellor, Karnatak University, Dharwar, India: to visit the United States, Europe, and Japan for discussion of higher education problems and policies; \$4,100;

Ministry of Education and Culture of the Government of Trinidad and Tobago, Port-of-Spain: to organize a complete archival program for Trinidad and Tobago; \$2,280;

Andhra University, Waltair, India: a survey of conditions and prospects for university publishing in India, by B. Muthuswami, reader in English; 5,000 rupees (about \$1,100);

University of Baroda, India: a survey of conditions and prospects for university publishing in India, by R. J. Patel, manager, University of Baroda Press; 5,000 rupees (about \$1,100);

Patna University, Bihar, India: a survey of conditions and prospects for university publishing in India, by Jagatnandan Sahay, registrar; 5,000 rupees (about \$1,100);

Mrs. Noramah Reksopoetranto, librarian, Indonesia: to visit children's libraries in the United States; \$685;

Abdul Jabbar Chalabi, Iraq Development Board, Baghdad: to observe work in developmental planning in the United States and Mexico; \$450;

Siebold Mewengkang, chairman, Free Trade Union for Oilworkers, East Kalimantan, Indonesia: additional expenses of a visit to the United States for study and observation in the field of labor relations and management; \$100;

Fund for grants of amounts not exceeding \$500 for allocation under the supervision of the Foundation's Director for Humanities; \$5,000.

## **Other Appropriations**

**OTHER APPROPRIATIONS**

*Major Interests, 1957*

American University of Beirut, Lebanon . . .	\$5,000,000
Rockefeller Foundation Polish Science Program . . . . .	475,000
Rockefeller Foundation Hungarian Refugee Aid Program . . . . .	250,000
Miscellaneous smaller grants . . . . .	741,710

## OTHER APPROPRIATIONS

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**G**RANTS WHICH FALL somewhat outside the specific programs, or which include elements relating to more than one aspect of the Foundation's work, are taken from general funds. In 1957 seven appropriations and nineteen smaller grants were of this character.

### AMERICAN UNIVERSITY OF BEIRUT

#### SCHOOL OF ARTS AND SCIENCES

Founded in 1866 through the efforts of Protestant missionary groups and chartered by the Board of Regents of the State of New York, the American University of Beirut, Lebanon, has long played a unique educational and cultural role in the Near East. With a faculty composed of Arab, American, and European scientists and scholars, the university has combined throughout its history a strong tradition of science and scholarship with a deep respect for the cultural values, potentialities, and problems of the Near East. It now has an enrollment of 2,000 and a faculty of 340 in its Schools of Arts and Sciences, Agriculture, Engineering, Medicine, Public Health, Nursing, and Pharmacy. In addition there are 1,460 students in its preparatory school, the International College.

Like most other educational institutions throughout the world, the American University has found itself hard pressed by the spiralling rise in the costs of education which followed World War II. The gap between its own resources and costs of living in Lebanon has steadily widened, and

of its several units, the School of Arts and Sciences, the core of a liberal university, has been most affected. To strengthen both undergraduate and graduate education in this school, The Rockefeller Foundation has appropriated \$5,000,000 to the American University.

At least 80 per cent of the funds to be provided by the Foundation will be used over the next ten to twelve years to strengthen faculty salaries, to provide improved facilities for research, and to enable the university to offer an increased number of scholarships, for tuition and living expenses, to students from other Near Eastern countries as well as Lebanon.

In previous years the Foundation has contributed more than \$4,000,000 in support of work in medicine, the humanities, and the social sciences at the American University of Beirut.

#### POLISH SCIENCE PROGRAM

During 1957 the Foundation resumed assistance to research and educational activities in Poland which had been interrupted during World War II and the postwar years. At the invitation of the Polish government, four Foundation officers, headed by Dr. Warren Weaver, Vice-President for Natural and Medical Sciences, visited that country early in 1957. Subsequent conversations and correspondence with Polish scientists, university administrators, and government authorities led to an appropriation of \$300,000 for the purchase of scientific materials and minor items of equipment for a number of Polish universities and research institutions. A second grant of \$175,000, also made during 1957, will furnish fellowships for Polish scholars to study in other countries.

The fellowship awards are intended to help meet one of the most pressing needs in Polish science today—opportunities for young developing scientists to visit other coun-

tries for observation and study of work being done in their fields. The fellowships are administered as part of the Foundation's regular fellowship program and are awarded, after personal interviews with Foundation fellowship advisors, to candidates nominated by Polish institutions assuring posts to the fellows upon their return to Poland. Older, established Polish scholars are renewing their acquaintance with their colleagues in other countries through travel grants awarded under the Foundation's regular grant-in-aid budget.

The \$300,000 grant will partially meet a second urgent scientific need in Poland—research supplies, minor equipment, and scientific literature. The universities at Warsaw, Poznan, Wrocław, Lublin, Cracow, and Łódz, medical and agricultural schools, research institutes affiliated with the Ministries of Health and Agriculture, and the laboratories and research institutes of the Polish Academy of Sciences, will share the grant.

Nine committees composed of representatives of the different institutions are responsible for the selection and allocation of the materials to be purchased. At Warsaw, Poznan, Wrocław, and Lublin, cities in which are located both universities and agricultural and medical schools, the rectors of the institutions have appointed joint committees to consider the needs of scientists and laboratories in these cities. Committees representing the universities and medical academies in Cracow and Łódz have also been appointed by the rectors of these institutions.

Funds for the Ministry of Health are being disbursed according to the recommendations of a committee appointed by the Minister, as will those for the Ministry of Agriculture. The needs of the laboratories and institutes of the Polish Academy of Sciences are being determined by a committee appointed by its president. As the lists are received, the Foundation is attending to the details of purchase and shipment.

**HUNGARIAN REFUGEE AID PROGRAM**

To continue its assistance to Hungarian refugees, particularly scholars and students in Austrian educational institutions, The Rockefeller Foundation appropriated an additional \$250,000 during 1957. The grant permits the Austrian institutions which have been providing for more than 600 Hungarian students to extend this aid through a further six-month period to the end of the 1957-1958 academic year.

The Foundation initiated its program of aid to Hungarian students and scholars in December, 1956, with appropriations totaling \$1,200,000. With these funds, and those made available in 1957, the Foundation has made allocations to 22 institutions and organizations, as follows:

**University of Vienna, Austria:**

Support of its program for Hungarian refugee students; 3,710,000 Austrian schillings (about \$148,400);

Support of its program for Hungarian refugee research scholars; 1,200,000 Austrian schillings (about \$48,000);

Toward the administrative expenses of the Austrian Rectors' Conference concerning Hungarian refugee students; 10,000 Austrian schillings (about \$400);

**Technical Institute, Vienna, Austria:**

Support of its program for Hungarian refugee students; 3,981,000 Austrian schillings (about \$159,240);

Support of its program for Hungarian refugee research scholars; 360,000 Austrian schillings (about \$14,400);

Academy for Music and Dramatic Arts, Vienna, Austria: support of its program for Hungarian refugee students; 973,000 Austrian schillings (about \$38,920);

Academy for Plastic Arts, Vienna, Austria: support of its program for Hungarian refugee students; 888,500 Austrian schillings (about \$35,540);

Academy of Applied Art, Vienna, Austria: support of its program for Hungarian refugee students; 326,500 Austrian schillings (about \$13,060);

Institute for World Trade, Vienna, Austria: support of its program for Hungarian refugee students; 768,000 Austrian schillings (about \$30,720);

Institute for Agriculture, Vienna, Austria:

Support of its program for Hungarian refugee students; 297,500 Austrian schillings (about \$11,900);

Support of its program for Hungarian refugee research scholars; 194,000 Austrian schillings (about \$7,760);

Institute of Veterinary Science, Vienna, Austria: support of its program for Hungarian refugee students; 195,000 Austrian schillings (about \$7,800);

Caritas Association of the Archbispopric of Vienna, Austria: support of its program of aid to Hungarian refugee students; 125,000 Austrian schillings (about \$5,000);

University of Innsbruck, Austria:

Support of its program for Hungarian refugee students; 2,466,000 Austrian schillings (about \$98,640);

Support of its program for Hungarian refugee research scholars; 348,000 Austrian schillings (about \$13,920);

University of Graz, Austria:

Support of its program for Hungarian refugee students; 1,449,000 Austrian schillings (about \$57,960);

Support of its program for Hungarian refugee research scholars; 348,000 Austrian schillings (about \$13,920);

Technical Institute, Graz, Austria:

Support of its program for Hungarian refugee students; 1,170,500 Austrian schillings (about \$46,820);

Support of its program for Hungarian refugee research scholars; 200,000 Austrian schillings (about \$8,000);

Netherlands Association for the Hungarian High School at Bad Iselsberg, Austria: toward support of this school for Hungarian refugee children; \$100,000;

Mining Institute, Leoben, Austria: support of its program for Hungarian refugee students; 646,000 Austrian schillings (about \$25,840);

Mozart Academy for Music and Dramatic Arts, Salzburg, Austria: support of its program for Hungarian refugee students; 619,000 Austrian schillings (about \$24,760);

Toward the purchase and shipment, through the International Committee for the Red Cross in Vienna and the Hungarian Red Cross in Budapest, of medical books for the library of the Medical Faculty of the University of Budapest; \$2,500;

National Academy of Sciences, Washington, D.C.: toward the costs of its program of aid to refugee Hungarian scholars and scientists; \$180,000;

Institute of International Education, New York: programs of orientation and English language instruction for Hungarian refugee university students, conducted at Bard College, St. Michael's College, and other American colleges and universities; \$122,059;

World University Service, New York: support of its Hungarian refugee student program; \$46,501;

American Council for Emigrés in the Professions, Inc., New York: toward the administrative expenses of its program for the selection and placement of Hungarian refugees in the professions; \$9,000;

National Committee for Resettlement of Foreign Physicians, Inc., New York: toward the administrative expenses of its program for the selection and placement of Hungarian refugee physicians in the United States; \$5,000;

Congress for Cultural Freedom, Paris, France: toward establishment and support of the Philharmonia Hungarica; \$70,000.

In addition, the Foundation provided direct awards to 25 Hungarian refugee scholars, artists, and scientists.

THE PRESIDENT'S COMMITTEE FOR HUNGARIAN  
REFUGEE RELIEF

In December of 1956 the President of the United States established The President's Committee for Hungarian Refugee Relief to assure full coordination of the refugee relief and resettlement activities of governmental and voluntary agencies. The Committee has played an important role in supervising and financing the immigration into this country of Hungarian refugees sponsored by private agencies, and in helping these refugees establish themselves as productive members of American communities.

To help The President's Committee with the costs of a program designed to facilitate the placement of Hungarian refugees in the United States, The Rockefeller Foundation appropriated \$35,000 in 1957.

INTERNATIONAL HOUSE OF JAPAN, INC.

Opened in 1955, the International House of Japan, Inc., has already become an active center for cultural exchange between Japanese and foreign scholars and artists. The house itself, beautifully designed and conveniently located not far from the center of Tokyo, is now considered to be one of the city's most attractive buildings.

The program and related activities of the International House have developed partly through the planning of its staff and Board of Directors, but partly also because of the steadily increasing demands made on it and its facilities by individuals and organizations concerned with international cultural relations.

As part of its program, the house has sponsored the visits to Japan of distinguished scholars, and has helped

to plan visits abroad by Japanese scholars. Hundreds of foreign scholars and artists who have stayed at the house or used its facilities have been assisted in their contacts in Japan. In some instances, the house has organized special discussion groups for these visitors.

The International House has sponsored a monthly series of lectures on foreign relations by foreign visitors as well as a second monthly series of lectures on various topics of international interest. A Japanese study seminar assisted by the house has served to bring foreign scholars into touch with important Japanese in many different fields. The library is not only an excellent reference center, but has also proved useful in introducing visiting scholars to the widely scattered library resources of Japan.

To aid the further general development of the International House of Japan, The Rockefeller Foundation appropriated \$125,000 during 1957. The new grant, available over a five-year period, brings to well over \$800,000 the amount contributed by the Foundation to the house since 1951.

#### NATIONAL COUNCIL ON COMMUNITY FOUNDATIONS, INC.

In the United States and Canada there are well over 200 community foundations with combined assets totaling several hundreds of millions of dollars. These foundations, administered by citizens of the community to meet local charitable needs, have been an important part of American philanthropy for several decades and hold a significant portion of all philanthropic funds today available in this country.

Ten years ago the community foundations joined together in forming the National Committee on Community Foundations which has had as its primary function the organization of an annual meeting for the exchange of in-

formation. The National Council on Community Foundations, Inc., the successor to the National Committee, is now exploring ways of expanding its services both as a clearinghouse for information and a source of advice and guidance for its members. A Rockefeller Foundation grant of \$45,000, of which \$35,000 is available on a matching basis, will aid the council's efforts during a three-year period.

#### OTHER GRANTS

Kyoto University, Research Institute for Fundamental Physics, Japan: exchange of scientists between Japan and other countries; \$15,000 for a five-year period;

Association of American Universities, New York: expenses in connection with the 1958 meeting of the Association of Universities of the British Commonwealth; \$10,000;

Brooklyn College, New York: preliminary planning for an area studies program; \$10,000;

National Academy of Sciences, Washington, D.C.:

Toward the expenses of the first International Congress of Radiation Research; \$10,000;

Toward expenses of a visit to American research institutions and medical schools by six women scientists from the Soviet Union; \$10,000;

Harvard University, Cambridge, Massachusetts: preparation of an edition of Newton's *Principia*; \$8,500;

The Reverend Edward B. Rooney, S.J., president, the Jesuit Educational Association, New York: to visit Jesuit educational institutions in the Near and Far East; \$6,000;

Distribution of gift copies of *Principles of Plant Pathology*, by Dr. E. C. Stakman, Special Consultant for Agriculture, and Dr. J. George Harrar, Director for Agriculture; \$5,510;

Association of American Colleges, Washington, D.C.: preparation and publication of a directory of fellowships in the arts and sciences; \$5,000;

Dr. Carter Davidson, president, Union College, Schenectady, New York, and Mrs. Davidson: to visit Europe to observe the progress and the reactions of foreign students after their return to their native countries; \$4,900;

Publication of a directory of scholarship and other training awards made by The Rockefeller Foundation; \$3,500;

Dr. Tatsuo Kawata, Department of Mathematics, Tokyo Institute of Technology, Japan: to visit centers of statistical study in the United States; \$3,000;

S. M. Nasaruddin Latif, chief of religious office and marriage counselor, Ministry of Religion, Djakarta, Indonesia: to observe professional activities in marriage counseling in the United States and Europe; \$3,000;

University of Kansas, Lawrence: participation in a number of summer institutes in the United States, by Professor Gustave Choquet, Faculty of Sciences, University of Paris, France; \$2,500;

Dr. Edwin Sharp Burdell, president, Cooper Union, New York: to visit Scandinavia in connection with the work of the Scandinavian Seminar for Cultural Studies; \$2,000;

University of Hawaii, Honolulu: a visit to the university by Dr. Samuel P. Hayes, executive director, Foundation for Research in Human Behavior, University of Michigan, Ann Arbor; \$1,700;

Alan Bullock, censor, St. Catherine's Society, University of Oxford, England: to visit academic institutions in the United States in connection with the proposed founding of a new college at the University of Oxford; \$1,550;

University of the State of New York, State Department of Education, Albany: additional expenses of an exploratory study of the possibilities of inter-institutional cooperation among colleges and universities of the state; \$200;

Fund for grants of amounts not exceeding \$500 for allocation under the supervision of the President, the Executive Vice-President, the Vice-President for Natural and Medical Sciences, and the Secretary; \$5,000.

## **Fellowships**



## FELLOWSHIPS AND OTHER STUDY AWARDS

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THE Foundation's fellowship appointments are integrated with the interests of its several programs.

Through fellowships, chiefly for postdoctoral study, the Foundation seeks to advance knowledge in a wide variety of fields in medical education and public health, biological and medical research, agriculture, the social sciences, and the humanities. Fellowships are awarded on an international basis to outstanding men and women who have completed their specialized training, and who have shown promise of making important contributions to their fields of study in their native countries.

During 1957 a total of 532 persons held Foundation fellowships; 284 fellowships begun in previous years continued active into 1957, and 248 new awards became active during the year. Their distribution by program is as follows:

	Fellowships from previous years continued into 1957	New awards in 1957	Number of fellows active in 1957
Agriculture	78	45	123
Biological and Medical Research	50	41	91
Humanities	49	30	79
Hungarian Refugee Program	1	12	13
Medical Education and Public Health	75	72	147
Polish Science Program	0	10	10
Social Sciences	31	38	69
	—	—	—
	284	248	532

The fellows during 1957 came from 53 different countries. Countries represented by three or more fellows were:

Argentina	8	Japan	95
Australia	13	Korea	3
Brazil	39	Lebanon	13
Chile	24	Mexico	32
Colombia	30	Netherlands	3
Costa Rica	3	Norway	5
France	7	Pakistan	4
Germany	9	Peru	8
Hungary	16	Philippines	19
India	60	Poland	10
Indonesia	12	Sweden	10
Iraq	3	Turkey	25
Italy	5	United Kingdom	16
Jamaica	3	United States	14

Fellowships were also held during 1957 by individuals from the following countries: Belgium (2); Burma (1); Canada (1); Ceylon (1); National Republic of China (1); Denmark (2); Ecuador (1); Egypt (2); Finland (2); Greece (1); Guatemala (2); Honduras (1); Iceland (2); Iran (1); Israel (2); Libya (1); New Zealand (2); Nicaragua (2); Portugal (1); Puerto Rico (2); Switzerland (2); Thailand (1); Trinidad (1); Uganda (1); and the Union of South Africa (2). Six fellows during 1957 were appointed from the World Health Organization.

The Rockefeller Foundation made available a total of \$1,400,000 for its regular fellowship activities during 1957, allocated for use by the various programs. To support the fellowship program during 1958 the Foundation has appropriated \$1,425,000.

In 1957 the Foundation also made available \$1,150,000 for a special expanded program of fellowships, scholarships, and training awards for men and women from Asia, Latin America, the Middle East, and Africa. These funds provided

additional awards for candidates from the geographical areas mentioned above and included 71 fellowships, 39 scholarships, and 11 training awards. In support of this supplementary program during 1958 the Foundation has appropriated \$1,075,000.

In 1957 the Foundation initiated a Polish Science Program with funds made available under a separate allocation of \$175,000. Ten Polish fellows held appointments during the year, five in the field of agriculture, four in biological and medical research, and one in medical education and public health. Within a program made possible by two 1956 grants for emergency aid in the arts and sciences for refugee Hungarians, 13 fellows held awards during the year.

In addition to the fellowships awarded and administered directly by The Rockefeller Foundation, national agencies have awarded fellowships with funds contributed in 1957 and previous years by the Foundation. These agencies administered a total of 152 fellowships during 1957:

British Medical Research Council	13
Canadian Social Science Research Council	18
Humanities Research Council of Canada	35
National Research Council	
Medical Sciences	14
Social Science Research Council	60
Program in Political Theory and Legal Philosophy	12
	—
	152

Below is a listing of individuals whose fellowships, awarded under the regular and special programs of The Rockefeller Foundation, became active in 1957, and six fellows appointed in the same year by the Medical Research Council of Great Britain. The fellowships awarded by the British Council have been included in this listing because the

fellows received guidance and supervisory assistance from Foundation fellowship advisors.

The following information is included for each individual: name; country of origin; date of birth; highest degree; major field of interest; fellowship-awarding agency or program; institution with which fellow was affiliated when appointed; principal countries of fellowship study; and date of fellowship.

- ACOSTA CARREÓN, ARISTEO** (*Mexico*) b. 1925. M.S., Univ. of Nebraska 1954. Plant Science — Cytogenetics — Pathology (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957—.
- AGARIE, NARIYUKI** (*Japan, Ryukyu Islands*) b. 1930. B.A., State Univ. of Iowa 1955. Intercultural Understanding (H). Appointed from Univ. of the Ryukyus, Shuri City, Okinawa. *Place of Study:* U.S.A., 1957—.
- AGARWAL, SURESH KUMAR** (*India*) b. 1932. M.S., Univ. of Lucknow 1952. Biophysics (MEPH). Appointed from Univ. of Lucknow. *Place of Study:* U.S.A., 1957—.
- ALDUNATE SALAS, JORGE** (*Chile*) b. 1924. M.D., Univ. of Chile, Santiago, 1949. Pharmacology (MEPH). Appointed from Univ. of Chile. *Place of Study:* U.S.A., 1957—.
- ALVAREZ LOZANO, ORLANDO** (*Colombia*) b. 1928. M.D., Univ. of Cartagena 1955. Internal Medicine (MEPH). Appointed from Univ. of Cartagena. *Place of Study:* Colombia, 1957—.
- ALVAREZ Y LUNA, EDUARDO** (*Mexico*) b. 1927. M.S., Univ. of California 1954. Plant Science—Genetics (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957—.
- AMANO, TSUNEHISA** (*Japan*) b. 1917. Igakuhakushi, Osaka Univ. 1952. Biochemistry — Microbiology (BMR). Appointed from Osaka Univ. *Place of Study:* U.S.A., 1957—.
- ANDREW, COLIN SIDNEY** (*Australia*) b. 1920. B.S., Univ. of Queensland, Brisbane, 1953. Biochemistry — Nutrition (A). Appointed from Commonwealth Scientific and Industrial Research Organization, Brisbane. *Place of Study:* U.S.A., 1957—.
- ANZILOTTI, GIUSEPPE ROLANDO** (*Italy*) b. 1919. D.Litt., Univ. of Florence 1946. Literature (H). Appointed from Univ. of Pisa. *Place of Study:* U.S.A., 1957—.
- ATASAGUNGIL, MUZAFFER** (*Tur-*

- key) b. 1916. M.D., Univ. of Istanbul 1940. Endocrinology (MEPH). Appointed from Univ. of Ankara. *Place of Study:* U.S.A., 1957-.
- BAHL, KALICHARAN (*India*) b. 1927. M.A., Punjab Univ., Solan, 1955. Intercultural Understanding (H). Appointed while on Deccan Coll., Poona, fellowship. *Place of Study:* U.S.A., 1957-.
- BAJAJRE V., YAMIL (*Colombia*) b. 1919. M.D., Univ. of Cartagena 1947. Parasitology (MEPH). Appointed from Univ. of Cartagena. *Place of Study:* Chile, 1957-.
- BALASSA, BELA A. (*Hungary*) b. 1928. Ph.D., Péter Pázmány Univ. of Budapest 1951. Economics (HRP). *Place of Study:* U.S.A., 1957-.
- BALINTFY, JOSEPH L. (*Hungary*) b. 1924. Dipl., Univ. of Technical Sciences, Budapest, 1948. Industrial Economics (HRP). *Place of Study:* U.S.A., 1957-.
- BALOGH, KÁROLY (*Hungary*) b. 1930. M.D., Univ. of Budapest 1954. Pathological Histochemistry (HRP). *Place of Study:* U.S.A., 1957-.
- BARBOSA, MARIO (*Brazil*) b. 1925. D.V.M., Rural Univ. of the State of Minas Gerais, Belo Horizonte, 1948. Veterinary Science (A). Appointed from Rural Univ. of the State of Minas Gerais. *Place of Study:* U.S.A., 1957-.
- BARDURI, CARLOS HORACIO (*Argentina*) b. 1919. Ing. Agr., Natl. Univ. of La Plata 1944. Plant Science—Forestry (A). Appoint- ed from Inst. of Applied Botany, Castelar. *Place of Study:* Sweden, 1957-.
- BARRALES PIZARRO, HUGO LEONEL (*Chile*) b. 1927. M.S., McGill Univ., Montreal, 1951. Plant Science—Physiology (A). Appointed from Ministry of Agric., Chillán. *Place of Study:* U.S.A., 1957-.
- BARRETO, HENRIQUE PAULO CALMON DE BARROS (*Brazil*) b. 1929. M.D., Paulista School of Med., São Paulo, 1954. Basic Medical Sciences (MEPH). Appointed from Paulista School of Med. *Place of Study:* U.S.A., 1957-.
- BAYHON, ELIZABETH MARTELINO (*Philippines*) b. 1919. B.S., Univ. of Santo Tomás, Manila, 1947. Drama (H). Appointed from Arena Theatre, Philippine Normal Coll., Manila. *Place of Study:* U.S.A., 1957-.
- BENGÜL, NEJAT (*Turkey*) b. 1926. D.Econ., Faculty of Economics, Istanbul, 1954. Economics (SS). Appointed from Univ. of Ankara. *Place of Study:* U.S.A., 1957-.
- BERGER, STANISLAW (*Poland*) b. 1923. D.Agr., Marie Curie Skłodowska Univ., Lublin, 1951. Animal Science — Nutrition (A). Appointed from Central School of Rural Economics, Warsaw, and State Inst. of Hygiene, Warsaw. *Place of Study:* U.S.A., 1957-.
- BINAK, KENAN (*Turkey*) b. 1929. M.D., Univ. of Istanbul 1954. Cardiology (MEPH). Appointed from 1st Internal Clinic, Univ. of Istanbul. *Place of Study:* U.S.A., 1957-.

- BJERKEDAL, TOR (*Norway*) b. 1926. M.D., Univ. of Oslo 1952. Public Health (MEPH). Appointed from Univ. of Oslo. *Place of Study:* U.S.A., 1957-.
- BOTERO ANGEL, JESÚS (*Colombia*) b. 1929. M.D., Univ. of Antioquia, Medellín, 1955. Biochemistry (MEPH). Appointed from Univ. of Antioquia. *Place of Study:* U.S.A., 1957-.
- BOTTURA, CASSIO (*Brazil*) b. 1920. M.D., Univ. of São Paulo 1946. Hematology (MEPH). Appointed from Univ. of São Paulo, Ribeirão Preto. *Place of Study:* Italy, 1957-.
- BRAVO, CBSAR (*Colombia*) b. 1926. M.D., Univ. of Antioquia, Medellín, 1954. Internal Medicine (MEPH). Appointed from Univ. of Antioquia. *Place of Study:* U.S.A., 1957-.
- BREMNER, JOHN McCOLL (*United Kingdom*) b. 1922. Ph.D., Univ. of London 1948. Soil Science (A). Appointed from Rothamsted Experimental Station, Harpenden. *Place of Study:* U.S.A., 1957-.
- BULL, HEDLEY NORMAN (*United Kingdom*) b. 1932. Ph.B., Univ. of Oxford 1955. Political Science (SS). Appointed from London School of Economics and Political Science. *Place of Study:* U.S.A., 1957-.
- BUTLER, JOHN (*United Kingdom*) b. 1923. M.R.C.P., London, 1951. Physiology (BMRC). Appointed from Queen Elizabeth Hosp., Birmingham. *Place of Study:* U.S.A., 1957-.
- CAMPOS STREET, LUCIANO (*Chile*) b. 1927. Ing. Agr., Univ. of Chile, Santiago, 1950. Plant Science — Entomology (A). Appointed from Ministry of Agric., Santiago. *Place of Study:* U.S.A., 1957-.
- CARNEIRO DA SILVA FILHO, JOSÉ (*Brazil*) b. 1929. M.D., Univ. of Recife 1954. Histology (BMR). Appointed from Univ. of Recife. *Place of Study:* Canada, 1957-.
- CASTILLO, BERNARDO S. (*Philippines*) b. 1916. B.S., Univ. of the Philippines, College, Laguna, 1940. Plant Science — Pathology (A). Appointed from Bureau of Plant Industry, Manila. *Place of Study:* U.S.A., 1957-.
- CERVANTES ROMO, JAVIER (*Mexico*) b. 1926. Ing. Agr., School of Agric., Cd. Juárez, 1951. Plant Science—Genetics (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957-.
- CÉSPEDES, AURELIO (*Colombia*) b. 1929. Teacher's Dipl., Men's Normal School 1947. Biology and Natural Sciences (MEPH). Appointed from Univ. of Antioquia, Medellín. *Place of Study:* U.S.A., 1957-.
- CETİN, TURKAN (*Turkey*) b. 1929. M.D., Univ. of Istanbul 1952. Pediatrics (MEPH). Appointed from Univ. of Ankara. *Place of Study:* U.S.A., 1957-.
- CEV, MUZAFFER (*Turkey*) b. 1921. M.D., Univ. of Istanbul 1945. Experimental Surgery (MEPH). Appointed from Univ. of Istanbul. *Place of Study:* U.S.A., 1957-.
- CHANY, CHARLES (*France*) b. 1920. Lic., Faculty of Med., Univ. of Paris 1952. Biology — Virology (BMR). Appointed from Pas-

- teur Inst., Paris. *Place of Study:* U.S.A., 1957-.
- CHOWDHURY, AMIYA BIKASH (India)** b. 1923. M.B., Univ. of Calcutta 1947. Biology — Histology (BMR). Appointed from School of Tropical Med., Calcutta. *Place of Study:* U.S.A., 1957-.
- CLAVER, FRANCISCO KELVIN (Argentina)** b. 1917. Ing. Agr., Natl. Univ. of La Plata 1942. Plant Science — Plant Physiology (A). Appointed from Natl. Univ. of La Plata. *Place of Study:* U.S.A., 1957-.
- CORREA, PERY RIET (Brazil)** b. 1915. M.D., Univ. of Rio Grande do Sul, Pôrto Alegre, 1937. Physiology (MEPH). Appointed from Univ. of Rio Grande do Sul. *Place of Study:* Canada, 1957-.
- CRANSTON, WILLIAM IAN (United Kingdom)** b. 1928. M.R.C.P., London, 1953. Experimental Medicine (BMRC). Appointed from Univ. of Oxford. *Place of Study:* U.S.A., 1957-.
- CRISPÍN MEDINA, ALFONSO (Mexico)** b. 1926. M.A., Univ. of Idaho 1955. Plant Science — Pathology (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957-.
- CROSS, BARRY ALBERT (United Kingdom)** b. 1925. Ph.D., Univ. of Cambridge 1953. Biology — Neurology (BMR). Appointed from Univ. of Cambridge. *Place of Study:* U.S.A., 1957-.
- CUBA CAPARO, ALBERTO DIOMEDES (Peru)** b. 1915. M.D., Univ. of San Marcos, Lima, 1943. Animal Science — Veterinary Science (NSA; A). Appointed twice from Univ. of San Marcos. *Place of Study:* Brazil, 1954-55; U.S.A., 1957-.
- DAVIDE, JORGE G. (Philippines)** b. 1928. M.S., Cornell Univ. 1955. Soil Science (A). Appointed from Univ. of the Philippines, College, Laguna. *Place of Study:* U.S.A., 1957-.
- DAVIES, ALAN FRASER (Australia)** b. 1924. M.A., Univ. of Melbourne 1946. Political Science (SS). Appointed from Univ. of Melbourne. *Place of Study:* England, 1957-.
- DEMAUREX, JACQUELINE (Switzerland)** b. 1924. Dipl., Le Bon Secours School of Nursing, Geneva, 1954. Nursing Education (MEPH). Appointed from Univ. Pediatric Hosp., Geneva. *Place of Study:* U.S.A., 1957-.
- DÍAZ MORENO, JAIME R. (Ecuador)** b. 1927. M.A., Inter-American Inst. of Agric. Sciences, Turrialba, Costa Rica, 1954. Plant Science — Pathology (A). Appointed from Inter-American Co-operative Agric. Service, Pichilingue. *Place of Study:* U.S.A., 1957-.
- DIMITRIYADI, YORGİ (Turkey)** b. 1927. Ph.D., Univ. of Istanbul 1956. Economics (SS). Appointed from Univ. of Istanbul. *Place of Study:* U.S.A., 1957-.
- DIMOCK, EDWARD CAMERON, JR. (United States)** b. 1929. S.T.M., Harvard Univ. 1954. Intercultural Understanding (H). Appointed while Junior Linguistic Scholar, Deccan Coll., Poona, India. *Place of Study:* U.S.A., 1957-.
- DJAJADININGRAT, IDRUS NASIR (Indonesia)** b. 1920. M.A., Cor-

- nell Univ. 1957. International Relations (SS). Appointed from Ministry of Foreign Affairs, Djakarta. *Place of Study:* U.S.A., 1957~.
- DUPEUX, GEORGES (*France*) b. 1920. Agrégé, Univ. of Paris 1943. Electoral Sociology (SS). Appointed from Natl. Foundation of Political Sciences, Paris. *Place of Study:* Norway, 1957~.
- ECEVIT, BÜLENT (*Turkey*) b. 1925. Univ. of Ankara 1944-46; Univ. of London 1946-48. Intercultural Understanding (H). Appointed from *Ulus*, Ankara. *Place of Study:* U.S.A., 1957~.
- ERAZO MUÑOZ, LUIS ADALBERTO (*Colombia*) b. 1929. M.D., Xavier Univ., Bogotá, 1957. Basic Medical Sciences (MEPH). Appointed from Univ. of Valle, Cali. *Place of Study:* U.S.A., 1957~.
- ESPINOSA RESTREPO, OSCAR (*Colombia*) b. 1933. M.D., Natl. Univ. of Colombia, Bogotá, 1957. Neurophysiology and Basic Medical Sciences (MEPH). Appointed from Univ. of Valle, Cali. *Place of Study:* Colombia, 1957~.
- FARAH, FUAD SALIM (*Lebanon*) b. 1929. M.D., American Univ. of Beirut 1954. Internal Medicine (Dermatology) (MEPH). Appointed from American Univ. of Beirut. *Place of Study:* U.S.A., 1957~.
- FATTAL, SUZETTE GEORGES (*Lebanon*) b. 1930. B.S., American Univ. of Beirut 1953. Nursing Education (MEPH). Appointed from American Univ. of Beirut. *Place of Study:* U.S.A., 1957~.
- FERREIRA NETO, JOAQUIM MARTINS (*Brazil*) b. 1923. D.V.M., Rural Univ. of the State of Minas Gerais, Belo Horizonte, 1949. Veterinary Science (A). Appointed from Rural Univ. of the State of Minas Gerais. *Place of Study:* U.S.A., 1957~.
- FLACHE, STANISLAS (*Lebanon*) b. 1919. M.D., Univ. of Montpellier 1948. Public Health (MEPH). Appointed from United Nations Relief and Works Agency, Beirut. *Place of Study:* U.S.A., 1957~.
- FLORES, THOMAS GOBATON (*Philippines*) b. 1924. M.Ed., Cornell Univ. 1954. Agricultural Extension (A). Appointed from Univ. of the Philippines, College, Laguna. *Place of Study:* U.S.A., 1957~.
- FRACCARO, MARCO (*Sweden*) b. 1926. Lic.Med., Univ. of Pavia 1950. Biology—Human Genetics (BMR). Appointed from Univ. of Uppsala. *Place of Study:* Netherlands, 1957~.
- FUJINO, SHOZABURO (*Japan*) b. 1927. M.A., Hitotsubashi Univ., Tokyo, 1954. Economics (SS). Appointed from Hitotsubashi Univ. *Place of Study:* U.S.A., 1957~.
- FUNATSU, MASARU (*Japan*) b. 1913. D.Agr., Kyushu Univ., Fukuoka, 1957. Biochemistry (A). Appointed from Kyushu Univ. *Place of Study:* Denmark, 1957~.
- FUNKHOUSER, ROBERT KAY (*United States*) b. 1925. M.D., Harvard Univ. 1948. Philosophy and Theology in relation to Internal Medicine (BMR). Ap-

pointed while a teaching fellow at Western Reserve Univ. *Place of Study:* U.S.A., 1957-.

**FURTADO, CELSO MONTEIRO** (*Brazil*) b. 1920. Ph.D., Univ. of Paris 1948. Economics (SS). Appointed from United Nations Economic Mission for Latin America. *Place of Study:* England, 1957-.

**GADOLI, GANGADHAR GOPAL** (*India*) b. 1923. M.A., Univ. of Bombay 1944. Literature (H). Appointed from Sydenham Coll. of Commerce, Bombay. *Place of Study:* U.S.A., 1957-.

**GALLAGHER, JOHN** (*United Kingdom*) b. 1919. M.A., Univ. of Cambridge 1946. History (SS). Appointed from Univ. of Cambridge. *Place of Study:* France, 1957-.

**GEDDES, WILLIAM ROBERT** (*New Zealand*) b. 1916. Ph.D., London School of Economics and Political Science 1948. Social Anthropology (SS). Appointed from Auckland Univ. Coll. *Place of Study:* Thailand, 1957-.

**GEIGER, HERMAN JACK** (*United States*) b. 1925. Univ. of Chicago 1947-50. Social Medicine (MEPH). Appointed while student at Western Reserve Univ. *Place of Study:* Union of South Africa, 1957-.

**GERONIMAKIS, STYLIANOS** (*Greece*) b. 1908. B.A., Superior School of Economics, Athens, 1931. Economics (SS). Appointed from Ministry of Coordination, Athens. *Place of Study:* U.S.A., 1957-.

**GHANDUR, MUSTAFA HABIB** (*Lebanon*) b. 1926. M.D., American

Univ. of Beirut 1952. Pediatrics (MEPH). Appointed from American Univ. of Beirut. *Place of Study:* U.S.A., 1957-.

**GHITIS, JACOBO** (*Colombia*) b. 1928. M.D., Univ. of Antioquia, Medellín, 1952. Basic Medical Sciences (MEPH). Appointed from Univ. of Valle, Cali. *Place of Study:* U.S.A., 1957-.

**GITLER HAMMER, SAMUEL CARLOS** (*Mexico*) b. 1933. Civil Engineer, Natl. Univ. of Mexico 1956. Mathematics (BMR). Appointed while grad. student at Princeton Univ. *Place of Study:* U.S.A., 1957-.

**GOLEWSKI, STANISLAW** (*Poland*) b. 1920. M.S., Univ. of Lodz 1950. Biochemistry — Nucleic Acids (BMR). Appointed from Med. Acad., Łódź. *Place of Study:* France, 1957-.

**GONZÁLEZ NAVARRO, Moisés** (*Mexico*) b. 1926. M. in Social Sciences, Col. de México, Mexico City, 1945. History (H). Appointed from Col. de México and Ministry of the Treasury. *Place of Study:* France, 1957-.

**GOPINATH, NAGARUR** (*India*) b. 1922. M.B.B.S., Madras Med. Coll. 1945. Surgery (MEPH). Appointed from Christian Med. Coll., Vellore. *Place of Study:* U.S.A., 1957-.

**GORE, KRISHNAJI SHANKER** (*India*) b. 1922. M.S., Cornell Univ. 1956. Animal Science—Entomology (A). Appointed from Bonnay Agric. Dept., Poona. *Place of Study:* U.S.A., 1957-.

**GÜRBÜZER, BEDRI** (*Turkey*) b. 1916. M.D., Univ. of İstanbul 1939. Cardiology (MEPH). Ap-

- pointed while fellow in cardiology at Metropolitan Hosp., New York. *Place of Study:* U.S.A., 1957-.
- GUZMÁN PARADA, JORGE** (*Chile*) *b.* 1915. Ing. Agr., Univ. of Chile, Santiago, 1940. Food Technology (A). Appointed from Univ. of Chile. *Place of Study:* U.S.A., 1957-.
- HASEGAWA, MITSUTO** (*Japan*) *b.* 1912. D.Med.Sc., Keio Univ., Tokyo, 1946. Internal Medicine (MEPH). Appointed from Keio Univ. *Place of Study:* U.S.A., 1957-.
- HAYASHI, YUJIRO** (*Japan*) *b.* 1920. Rigakushi, Tokyo Univ. 1942. Biology—Embryology (BMR). Appointed from Nagoya Natl. Univ. *Place of Study:* U.S.A., 1957-.
- HEATH, DONALD ALBERT** (*United Kingdom*) *b.* 1928. M.D., Univ. of Sheffield 1956. Pathology (BMRC). Appointed from Univ. of Birmingham. *Place of Study:* U.S.A., 1957-.
- HESSELVIK, LENNART KARL FREDRIK** (*WHO*) *b.* 1917. M.D., Univ. of Stockholm 1949. Public Health (MEPH). Appointed from World Health Organization. *Place of Study:* U.S.A., 1957-.
- HILL, THOMAS PETER** (*United Kingdom*) *b.* 1929. M.A., Univ. of Oxford 1956. Economics and Economic Statistics (SS). Appointed from Univ. of Oxford. *Place of Study:* U.S.A., 1957-.
- HIRST, RONALD ROBERT** (*Australia*) *b.* 1912. M.Econ., Univ. of Adelaide 1950. Economics (SS). Appointed from Univ. of Ade-
- laide. *Place of Study:* U.S.A., 1957-.
- ICHIYE, TAKASHI** (*Japan*) *b.* 1921. Rigakuhakase, Tokyo Univ. 1953. Marine Biology (BMR). Appointed from Central Meteorological Observatory, Tokyo. *Place of Study:* U.S.A., 1957-.
- ILGAZ, AYTEN NECLA** (*Turkey*) *b.* 1928. M.D., Univ. of Ankara 1952. Pediatric Cardiology (MEPH). Appointed from Univ. of Ankara. *Place of Study:* U.S.A., 1957-.
- ISAAC, DANIEL** (*India*) *b.* 1922. M.B.B.S., Madras Med. Coll. 1947. Medical and Hospital Administration (MEPH). Appointed from Christian Med. Coll. Hosp., Vellore. *Place of Study:* U.S.A., 1957-.
- JABBUR, SUHAYL JIBRA'IL** (*Lebanon*) *b.* 1931. M.D., American Univ. of Beirut 1956. Biology—Physiology (BMR). Appointed from American Univ. of Beirut. *Place of Study:* U.S.A., 1957-.
- JACK, IAN** (*Australia*) *b.* 1928. M.S., Univ. of Melbourne 1953. Biology—Virology (BMR). Appointed from Royal Children's Hosp., Melbourne. *Place of Study:* U.S.A., 1957-.
- JACOB, CONNAYIL MANI** (*India*) *b.* 1919. M.S., Iowa State Coll. 1952. Agricultural Engineering (A). Appointed from Allahabad Agric. Inst. *Place of Study:* U.S.A., 1957-.
- JANKIEWICZ, LESZEK STANISLAW** (*Poland*) *b.* 1925. Ph.D., Central School of Rural Economics, Warsaw, 1957. Plant Science —

- Physiology (A). Appointed from Central School of Rural Economics. *Place of Study:* U.S.A., 1957-.
- JIMÉNEZ RAMÍREZ, José Iván (*Colombia*) b. 1927. M.D., Univ. of Antioquia, Medellín, 1951. Physiology (MEPH). Appointed from Univ. of Antioquia. *Place of Study:* U.S.A., 1957-.
- JOHNSON, CHARLES WILLIAM (*United States*) b. 1922. M.D., Meharry Med. Coll. 1953. Microbiology (MEPH). Appointed from Meharry Med. Coll. *Place of Study:* U.S.A., 1957-.
- JÖRBERG, GUSTAV LENNART (*Sweden*) b. 1927. Fil.Lic., Univ. of Lund 1956. Economic History (SS). Appointed from Univ. of Lund. *Place of Study:* U.S.A., 1957-.
- JUTISZ, MARIAN (*France*) b. 1920. Ph.D., Univ. of Paris 1949. Biochemistry — Proteins (BMR). Appointed from Coll. de France, Paris. *Place of Study:* U.S.A., 1957-.
- KAHN, SHOLOM JACOB (*Israel*) b. 1918. Ph.D., Columbia Univ. 1950. Literature (H). Appointed from Hebrew Univ., Jerusalem. *Place of Study:* U.S.A., 1957-.
- KAILOLA, FATIMA SETI-ARTI (*Indonesia*) b. 1919. Martha Graham School of Contemporary Dance, New York, 1951-52. Dance (H). Appointed from Sutalagati Art of Movement School, Djakarta. *Place of Study:* U.S.A., 1957-.
- KAJI, MASARO (*Japan*) b. 1924. D.Med.Sc., Kyushu Univ., Fukuoka, 1952. Biology — Virology (BMR). Appointed from Kyushu Univ. *Place of Study:* U.S.A., 1957-.
- (BMR). Appointed from Kyushu Univ. *Place of Study:* U.S.A., 1957-.
- KALKAT, GURCHARN SINGH (*India*) b. 1927. M.S., Govt. Agric. Coll., Kanbur, 1955. Plant Parasitology — Entomology (A). Appointed from Punjab Agric. Dept. *Place of Study:* U.S.A., 1957-.
- KAMETAKA, MASAO (*Japan*) b. 1917. B.S., Tokyo Univ. 1940. Animal Science—Nutrition (A). Appointed from Tokyo Univ. *Place of Study:* U.S.A., 1957-.
- KAMO, HAJIME (*Japan*) b. 1922. D.Med.Sc., Kyushu Univ., Fukuoka, 1957. Public Health (MEPH). Appointed from Kyushu Univ. *Place of Study:* U.S.A., 1957-.
- KANDA, YUKISHIGE (*Japan*) b. 1929. M.D., Kurume Univ. 1952. Biology—Virology (BMR). Appointed from Kurume Univ. *Place of Study:* U.S.A., 1957-.
- KARADY, STEPHEN (*Hungary*) b. 1904. M.D., Péter Pázmány Univ. of Budapest 1929. Physiology (NS); Biology—Immunology (BMR). Appointed twice from Univ. of Szeged. *Place of Study:* Canada, 1937-38; France, 1957-.
- KARTA DI KOBSEMAH, JOESOEF (*Indonesia*) b. 1924. Univ. of Indonesia, Djakarta. Intercultural Understanding (H). Appointed from Indonesian Foreign Service. *Place of Study:* U.S.A., 1957-.
- KARUNAIRATNAM, MOSES CHRISTY (*Ceylon*) b. 1921. Ph.D., Univ. of Edinburgh 1950. Biochemistry (MEPH). Appointed

- from Univ. of Ceylon, Colombo.  
*Place of Study:* U.S.A., 1957-.
- KAYMAKCALAN, SABAHAT (*Turkey*) b. 1924. M.D., Univ. of Istanbul 1949. Cardiology (MEPH). Appointed from Univ. of Ankara. *Place of Study:* Sweden, 1957-.
- KAZGAN, GÜLTEN OZOK (*Turkey*) b. 1927. Ph.D., Univ. of Istanbul 1957. Economics (SS). Appointed from Univ. of Istanbul. *Place of Study:* U.S.A., 1957-.
- KEMENY, LORANT (*Hungary*) b. 1913. D.V.M., Hungarian Univ. of Agric. Science, Budapest, 1938. Biology — Virology (BMR). *Place of Study:* U.S.A., 1957-.
- KIJNER ZAIDMAN, HENRY (*Colombia*) b. 1928. M.D., Natl. Univ. of Colombia, Bogotá, 1955. Pediatrics (MEPH). Appointed from Univ. of Valle, Cali. *Place of Study:* Mexico, 1957-.
- KITAMURA, KATSUTOSHI (*Japan*) b. 1923. D.Med.Sc., Kyushu Univ., Fukuoka, 1953. Neurosurgery and Neuropathology (MEPH). Appointed from Kyushu Univ. *Place of Study:* Canada, 1957-.
- KNAPOWSKI, STANISLAW (*Poland*) b. 1931. Magister, Univ. of Wroclaw 1954. Mathematics (BMR). Appointed from Univ. of Poznan. *Place of Study:* England, 1957-.
- KOJIMA, NOBUO (*Japan*) b. 1915. Grad., Tokyo Univ. 1941. Literature (H). Appointed from Meiji Univ., Tokyo. *Place of Study:* U.S.A., 1957-.
- KOLLER, Dov (*Israel*) b. 1925.
- Ph.D., Hebrew Univ., Jerusalem, 1955. Plant Science—Ecology and Physiology (A). Appointed from Hebrew Univ. *Place of Study:* U.S.A., 1957-.
- KOSTRECKI, JAN (*Poland*) b. 1909. Ph.D., Agric. Coll., Lublin, 1957. Plant Science—Genetics (A). Appointed from Udyocz Plant Breeding Station, Warsaw. *Place of Study:* U.S.A., 1957-.
- KOSUGI, SHIGEMICHI (*Japan*) b. 1930. LL.B., Chuo Univ., Tokyo, 1953. Intercultural Understanding—Library Science (H). Appointed from Kokugakuin Univ., Tokyo. *Place of Study:* U.S.A., 1957-.
- KOZAI, SHIGERU (*Japan*) b. 1929. LL.B., Kyoto Univ. 1953. International Relations (SS). Appointed from Kyoto Univ. *Place of Study:* U.S.A., 1957-.
- KRZANOWSKA, HALINA KAZIMIERA (*Mrs. ADAM*) (*Poland*) b. 1926. Ph.D., Jagiellonian Univ., Cracow, 1949. Animal Science—Breeding (A). Appointed from Inst. of Animal Breeding, Puławy. *Place of Study:* Scotland, 1957-.
- KUMAR, ABHAYA (*India*) b. 1922. Ph.D., Univ. of Allahabad 1947. Clinical Biochemistry (MEPH). Appointed from Univ. of Lucknow. *Place of Study:* U.S.A., 1957-.
- KUN, JOSEPH (*Hungary*) b. 1931. B.A., Lóránd Eötvös Univ., Budapest, 1956. Intercultural Understanding (HRP). *Place of Study:* U.S.A., 1957-.
- KUNO, MOTYO (*Japan*) b. 1928. M.D., Kyoto Univ. 1954. Biol-

ogy—Physiology (BMR). Appointed from Yamaguchi Med. School, Ube. *Place of Study:* U.S.A., 1957~.

KURTAKAN, FERIDUN MEHMET (Turkey) b. 1918. Lic.Dipl., Istanbul School of Economics and Commerce 1942. Statistics (SS). Appointed from Central Statistical Office, Ankara. *Place of Study:* U.S.A., 1957~.

LASZOVSKY, KÁROLY (Hungary) b. 1897. Ph.D., Péter Pázmány Univ. of Budapest 1920. Astronomy (IEB; HRP). Appointed from 1) Hungarian State Astrophysical Observatory; 2) Hungarian Refugee Program. *Place of Study:* U.S.A., 1925; 1957~.

LATIF RASULPURI, MUHAMMAD (Pakistan) b. 1923. M.S., Punjab Agric. Coll., Lyallpur, 1954. Food Technology (A). Appointed from Punjab Agric. Coll. and Research Inst. *Place of Study:* U.S.A., 1957~.

LAZAR, JANOS ISTVAR (Hungary) b. 1929. Dipl. in History, Univ. of Szeged 1954. History (HRP). *Place of Study:* U.S.A., 1957~.

LINDBACK, KARL ASSAR EUGEN (Sweden) b. 1929. Fil.Lic., Univ. of Stockholm 1957. Economics (SS). Appointed while grad. student at Univ. of Stockholm. *Place of Study:* U.S.A., 1957~.

LÓPEZ MENDOZA, ENRIQUE (Mexico) b. 1926. M.D., Natl. Univ. of Mexico 1950. Neurophysiology (MEPH). Appointed from Univ. of San Luis Potosí. *Place of Study:* Mexico, 1957~.

MARTÍNEZ MARDÓNEZ, ALFONSO (Chile) b. 1920. M.D., Univ. of Chile, Santiago, 1944. Experimental Biology—Electron Microscopy (BMR). Appointed from Univ. of Chile. *Place of Study:* U.S.A., 1957~.

MARZUKI, JAZIR (Indonesia) b. 1926. School of Fine Arts, Paris, 1950-51. Arts (H). Appointed from TIFA Films, Ltd., Djakarta. *Place of Study:* U.S.A., 1957~.

MATBOS GÓMEZ, JOSÉ LUIS (Mexico) b. 1933. D.Sc., Natl. Univ. of Mexico 1957. Experimental Biology — Organic Chemistry (BMR). Appointed from Natl. Univ. of Mexico. *Place of Study:* U.S.A., 1957~.

MATSUBA, HIDEFUMI (Japan) b. 1904. LL.B., Keijo Imperial Univ. 1932. Intercultural Understanding (H). Appointed from Aichi Univ. *Place of Study:* U.S.A., 1957~.

MAYER, HENRY (Australia) b. 1919. M.A. (Hons.), Univ. of Melbourne 1952. Political Science (SS). Appointed from Univ. of Sydney. *Places of Study:* England, Netherlands, 1957~.

MC COURT, DESMOND (United Kingdom) b. 1923. Ph.D., Queen's Univ. of Belfast 1950. Social Geography (SS). Appointed from Magee Univ. Coll., Londonderry. *Place of Study:* U.S.A., 1957~.

MEHENDALE, MADHUKAR ANANT (India) b. 1918. Ph.D., Deccan Coll. Postgrad. and Research Inst., Poona, 1943. Intercultural Understanding (H). Appointed

- from Deccan Coll. *Place of Study*: U.S.A., 1957-.
- MENDOZA, HÉCTOR ALEJANDRO (*Mexico*) b. 1932. Natl. Univ. of Mexico 1953-54. Drama (H). Appointed from Natl. Univ. of Mexico. *Place of Study*: U.S.A., 1957-.
- MERSKEY, CLARENCE (*Union of South Africa*) b. 1914. M.R.C.P., London—Oxford, 1949. Hematology (MEPH). Appointed from Univ. of Cape Town. *Place of Study*: U.S.A., 1957-.
- MIHALY, ZOLTAN MARIO (*Hungary*) b. 1926. D.Leg.Sc., Péter Pázmány Univ. of Budapest 1950. International Relations and Political Science (HRP). *Place of Study*: U.S.A., 1957-.
- MILLER, ALLAN DAVID (*United States*) b. 1933. B.A., Harvard Univ. 1954. Music (H). Appointed while grad. student at Harvard Univ. *Place of Study*: U.S.A., 1957-.
- MIYAZAKI, ISAMU (*Japan*) b. 1923. B.A., Tokyo Univ. 1947. Economics (SS). Appointed from Economic Planning Board, Govt. of Japan, Tokyo. *Place of Study*: U.S.A., 1957-.
- MOERDIFI SOERIAATMADJA, TOEBAGORES (*Indonesia*) b. 1923. Police Training School, Sukabumi, 1944-45. Intercultural Understanding (H). Appointed twice from Police Headquarters, Djakarta. *Place of Study*: U.S.A., 1956; 1957-.
- MÖRNER, CARL MAGNUS BIRGERSSON (*Sweden*) b. 1924. Ph.D., Univ. of Stockholm 1953. History (H). Appointed from Library and Inst. of Ibero-American Studies, Stockholm School of Economics, and Univ. of Stockholm. *Place of Study*: U.S.A., 1957-.
- MOTA E LABUQUERQUE, IVAN DA (*Brazil*) b. 1920. M.D., Univ. of Recife 1946. Experimental Biology—Cell Physiology (BMR). Appointed from Univ. of São Paulo. *Place of Study*: England, 1957-.
- MULDOWNEY, FRANCIS PETER (*United Kingdom*) b. 1928. M.R.C.P., Edinburgh, 1955. Physiology (BMRC). Appointed from St. Vincent's Hosp., Dublin. *Place of Study*: U.S.A., 1957-.
- MULNARD, JACQUES GÉRARD (*Belgium*) b. 1922. M.D., Univ. of Brussels 1946. Biology—Embryology (BMR). Appointed from Univ. of Brussels. *Place of Study*: U.S.A., 1957-.
- MURACHI, TAKASHI (*Japan*) b. 1926. Igakushi, Kyoto Univ. 1949. Biochemistry — Enzymes (BMR). Appointed from Kyoto Univ. *Place of Study*: U.S.A., 1957-.
- NAIRN, NOEL BEDE (*Australia*) b. 1917. M.A. (Hons.I), Univ. of Sydney 1954. Economic History (SS). Appointed from New South Wales Univ. of Technology, Sydney. *Place of Study*: England, 1957-.
- NAKAYA, RINTARO (*Japan*) b. 1924. M.D., Tokyo Univ. 1948. Biochemistry — Microbiology (BMR). Appointed from Natl. Inst. of Health, Tokyo. *Place of Study*: U.S.A., 1957-.
- NAORA, HIROTO (*Japan*) b. 1927. D.Sc., Tokyo Univ. 1956. Biochemistry — Cytochemistry

- (BMR). Appointed from Cancer Inst., Tokyo. *Place of Study:* Belgium, 1957-.
- NASSEF, MOSTAFA (Egypt) b. 1922. D.Litt., Ain Shams Univ., Cairo, 1952. Literature (H). Appointed from Ain Shams Univ. *Place of Study:* U.S.A., 1957-.
- NEUMANN, RUDOLF (WHO) b. 1917. M.D., Univ. of Vienna 1940. Public Health (MEPH). Appointed from World Health Organization. *Place of Study:* England, 1957-.
- NICHOLAS, WARWICK LLEWELLYN (United Kingdom) b. 1926. Ph.D., Univ. of Liverpool 1953. Parasitology (BMRC). Appointed from Univ. of Liverpool. *Place of Study:* U.S.A., 1957-.
- NIEMEYER FERNÁNDEZ, HERMANN (Chile) b. 1918. M.D., Univ. of Chile, Santiago, 1942. Biochemistry (MEPH). Appointed from Univ. of Chile. *Place of Study:* U.S.A., 1957-.
- NISHIDA, KOJIRO (Japan) b. 1922. B.S., Univ. of Taihoku, Taiwan, 1944. Plant Science—Physiology (A). Appointed from Kanazawa Univ. *Place of Study:* U.S.A., 1957-.
- NOGUCHI, YOOICHI (Japan) b. 1918. B.S., Tokyo Univ. 1946. Forestry (A). Appointed from Tokyo Univ. *Place of Study:* U.S.A., 1957-.
- NOMURA, MASAYASU (Japan) b. 1927. B.A., Tokyo Univ. 1951. Biochemistry—Enzymes (BMR). Appointed from Tokyo Univ. *Place of Study:* U.S.A., 1957-.
- OBARA, JINZO (Japan) b. 1917. Nogakushi, Tokyo Univ. 1940. Animal Science — Physiology (A). Appointed from Natl. Inst. of Animal Health, Tokyo. *Place of Study:* U.S.A., 1957-.
- O'CONNELL, DANIEL PATRICK (Australia) b. 1924. Ph.D., Univ. of Cambridge 1951. International Relations and Legal Philosophy (SS). Appointed from Univ. of Adelaide. *Places of Study:* England, U.S.A., 1957-.
- OGAWA, KAZUO (Japan) b. 1928. M.D., Kyoto Univ. 1954. Biochemistry — Enzymes (BMR). Appointed from Kyoto Univ. *Place of Study:* U.S.A., 1957-.
- OHTSUKA, HIROKO (Japan) b. 1925. Swedish Covenant Hosp., Chicago, 1953. Nursing Education (MEPH). Appointed from Tokyo Univ. *Place of Study:* U.S.A., 1957-.
- OJEN, ARNE (Norway) b. 1928. Sosialokonomisk Embedseksamen, Univ. of Oslo 1954. Economics (SS). Appointed from Central Bureau of Statistics, Oslo. *Place of Study:* U.S.A., 1957-.
- ORTEGA CORONA, ALEJANDRO (Mexico) b. 1931. M.S., Ohio State Univ. 1954. Plant Science — Entomology (A). Appointed from Natl. Univ. of Mexico. *Place of Study:* U.S.A., 1957-.
- OSHIMA, CHOZO (Japan) b. 1916. D.Sc., Kyoto Univ. 1951. Biology — Genetics (BMR). Appointed from Natl. Inst. of Genetics, Misima. *Place of Study:* U.S.A., 1957-.
- OSINSKA, ZOFIA (Poland) b. 1923. D.Agr., Univ. of Wroclaw 1951. Animal Science—Nutrition (A). Appointed from Inst. of Animal Physiology and Nutrition, Pol-

- ish Acad. of Sciences, Bydgoszcz.  
*Place of Study:* U.S.A., 1957-.
- OUCHI, TSUTOMU (Japan)** b. 1918. Keizaigakushi, Tokyo Univ. 1942. Agricultural Economics (SS). Appointed from Tokyo Univ. *Place of Study:* U.S.A., 1957-.
- OZBIL, MELAHAT (Turkey)** b. 1925. M.D., Univ. of Istanbul 1949. Epidemiology and Virology (MEPH). Appointed from Univ. of Ankara. *Place of Study:* U.S.A., 1957-.
- PACHECO, FRANCISCO (Mexico)** b. 1922. M.S., Univ. of Massachusetts 1954. Plant Science—Entomology (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957-.
- PAI, DATTATRAYA NAGAPPA (India)** b. 1925. M.S., Univ. of Bombay 1955. Preventive and Social Medicine (MEPH). Appointed from Seth Gordhandas Sunderdas Med. Coll., Bombay. *Place of Study:* U.S.A., 1957-.
- PANTOJA OCEJO, CARLOS (Mexico)** b. 1929. M.D., Univ. of San Luis Potosí 1954. Preventive Medicine (MEPH). Appointed from Hosp. for Nutritional Diseases, Mexico City. *Place of Study:* U.S.A., 1957-.
- PENTONY, PATRICK (Australia)** b. 1915. M.A., Univ. of Western Australia, Nedlands, 1941. Psychology (SS). Appointed from Canberra Univ. Coll. *Place of Study:* U.S.A., 1957-.
- PERRY, LUDWALD ORREN PETTIPHER (United States)** b. 1923. M.D., Meharry Med. Coll. 1946. Gastroenterology (MEPH). Appointed from Meharry Med. Coll. *Place of Study:* U.S.A., 1957-.
- QUINTERO ZÚÑIGA, MARIO (Colombia)** b. 1929. M.D., Natl. Univ. of Colombia, Bogotá, 1954. General Surgery (MEPH). Appointed from Univ. of Valle, Cali. *Place of Study:* U.S.A., 1957-.
- RAJAN, ANN (India)** b. 1932. B.S., Christian Med. Coll., Vellore, 1953. Nursing Education (MEPH). Appointed from Christian Med. Coll. *Place of Study:* U.S.A., 1957-.
- RAMACHANDRAN, R. S. (India)** b. 1926. M.B.B.S., Madras Med. Coll. 1953. Pediatrics (MEPH). Appointed from Madras Med. Coll. *Place of Study:* U.S.A., 1957-.
- RAY, SIBNARAYAN (India)** b. 1921. M.A., Univ. of Calcutta 1942. History (H). Appointed from City Coll., Calcutta. *Place of Study:* U.S.A., 1957-.
- REID, CYRIL (Canada)** b. 1917. Ph.D. (D.I.C.), Imperial Coll. of Science and Technology, London, 1940. Biophysics—Molecular Biology (BMR). Appointed from Univ. of British Columbia, Vancouver. *Place of Study:* England, 1957-.
- RICHARDSON, GEORGE BARCLAY (United Kingdom)** b. 1924. M.A., Univ. of Oxford 1949. Economics (SS). Appointed from St. John Baptist Coll., Oxford. *Place of Study:* U.S.A., 1957-.
- ROBERTS, JOAN ELIZABETH (WHO)** b. 1909. S.R.N., Guy's Hosp., London, 1934. Nursing

- Education (MEPH). Appointed from World Health Organization. *Place of Study:* U.S.A., 1957~.
- ROCHA, José Costa (Brazil) b. 1927. M.D., Univ. of Recife 1951. Cardiology (MEPH). Appointed from Univ. of Recife. *Place of Study:* Mexico, 1957~.
- RODRÍGUEZ GÓMEZ, ALBERTO FERNANDO (Colombia) b. 1921. M.D., Natl. Univ. of Colombia, Bogotá, 1951. Pathology (MEPH). Appointed from Carlos Finlay Inst. of Special Studies, Bogotá. *Place of Study:* Colombia, 1957~.
- RODRÍGUEZ PLASENCIA, LUIS (WHO) b. 1914. M.D., Univ. of Havana 1940. Public Health (MEPH). Appointed from Pan American Sanitary Bureau, Washington, D. C. *Place of Study:* U.S.A., 1957~.
- ROSBACO, URBANO FRANCISCO (Argentina) b. 1920. Ing. Agr., Natl. Univ. of La Plata 1943. Plant Science—Plant Breeding (A). Appointed from Agric. Experiment Station, Tezanos Pinto (Entre Ríos). *Place of Study:* U.S.A., 1957~.
- ROY, SUJOY BUSHAN (India) b. 1919. M.R.C.P., Univ. of Edinburgh 1947. Cardiology (MEPH). Appointed from All-India Inst. of Med. Sciences, New Delhi. *Place of Study:* U.S.A., 1957~.
- SAGUIGUIT, GIL FRANCO (Philippines) b. 1921. M.S., Univ. of Illinois 1950. Agricultural Education (A). Appointed from Univ. of the Philippines, College, Laguna. *Place of Study:* U.S.A., 1957~.
- SAHNI, V. M. (India) b. 1927. Ph.D., Purdue Univ. 1957. Plant Science — Genetics (A). Appointed while student at Purdue Univ. *Place of Study:* U.S.A., 1957~.
- SAITO, SHOJI (Japan) b. 1914. D.Med.Sc., Keio Univ., Tokyo, 1949. Pharmacology (MEPH). Appointed from Keio Univ. *Place of Study:* U.S.A., 1957~.
- SALSALI, FATEMEH (Iran) b. 1926. Cert., American Univ. of Beirut 1955. Nursing Education (MEPH). Appointed from Ministry of Health, Teheran. *Place of Study:* U.S.A., 1957~.
- SANAVIO, PIERO (Italy) b. 1929. Ph.D., Univ. of Venice 1956. Literature (H). *Place of Study:* U.S.A., 1957~.
- SÁNCHEZ Y REYES, PATRICIO (Chile) b. 1928. M.D., Univ. of Chile, Santiago, 1956. Experimental Biology and Zoology (BMR). Appointed from Catholic Univ. of Chile, Santiago. *Place of Study:* U.S.A., 1957~.
- SANTOS, IBARRA SANTOS (Philippines) b. 1933. M.S., Univ. of Nebraska 1955. Plant Science—Genetics (A). Appointed from Univ. of the Philippines, College, Laguna. *Place of Study:* U.S.A., 1957~.
- SANYAL, ASHU TOSH (India) b. 1915. Assoc., Indian Agric. Research Inst., New Delhi, 1937. Soil Science (A). Appointed from West Bengal State Coll. of Agric., Calcutta. *Place of Study:* U.S.A., 1957~.
- SARASOLA, JULIO ANIBAL (Argentina)

- tina) b. 1911. Ing. Agr., Natl. Univ. of La Plata 1944. Plant Science—Plant Breeding (A). Appointed from Inst. of Applied Botany, Castelar. *Place of Study:* Germany, 1957~.
- SAVOSNICK, KURT MARTIN (Sweden) b. 1926. Fil.Lic., Univ. of Stockholm 1957. Economics (SS). Appointed from Univ. of Stockholm. *Place of Study:* England, 1957~.
- SCHILLING, JAYME (Brazil) b. 1924. M.D., Faculty of Med. of Pôrto Alegre 1949. Pharmacology (MEPH). Appointed from Univ. of Rio Grande do Sul, Pôrto Alegre. *Place of Study:* Chile, 1957~.
- SEGNI, CELESTINO (Italy) b. 1926. Dr.Jur., Univ. of Sassari 1953. Economics (SS). Appointed from Assn. for the Industrial Development of Southern Italy, Rome. *Place of Study:* U.S.A., 1957~.
- SENGUPTA, ARUN (India) b. 1920. M.S., Univ. of Lucknow 1944. Animal Science—Dairy (A). Appointed from Central Livestock Research and Breeding Station, Calcutta. *Place of Study:* U.S.A., 1957~.
- SHAH, CHANDRAHAS HIRALAL (India) b. 1920. Ph.D., Univ. of Bombay 1952. Economics (SS). Appointed from Univ. of Bombay. *Place of Study:* U.S.A., 1957~.
- SHARMA, DEVENDRA NATH (India) b. 1925. M.A., Univ. of Lucknow 1956. Medical Library Science (MEPH). Appointed from Univ. of Lucknow. *Place of Study:* U.S.A., 1957~.
- SHIMIZU, HIROKAZU (Japan) b. 1923. B.S., Tokyo Univ. 1946. Animal Science — Physiology (A). Appointed from Tohoku Univ., Sendai. *Place of Study:* England, 1957~.
- SHIN, BYONG-HYUN (Korea) b. 1920. M.A., American Univ., Washington, D. C., 1954. Economics (SS). Appointed from Bank of Korea, Seoul. *Place of Study:* U.S.A., 1957~.
- SHISHIDO, SHUNTARO (Japan) b. 1924. M.S., Tokyo Univ. 1947. Economics (SS). Appointed from Admin. Management Agency, Govt. of Japan, Tokyo. *Place of Study:* U.S.A., 1957~.
- SHONO, JUNZO (Japan) b. 1921. Kyushu Univ., Fukuoka, 1942-44. Literature (H). *Place of Study:* U.S.A., 1957~.
- SILVA FUENTES, SERGIO (Chile) b. 1926. M.D., Univ. of Chile, Santiago, 1949. Internal Medicine (MEPH). Appointed from Univ. of Chile. *Place of Study:* U.S.A., 1957~.
- SIMSEK, SEHER (Turkey) b. 1925. Army Nursing School 1944. Nursing Education (MEPH). Appointed from Ankara Med. School Hosp. *Place of Study:* U.S.A., 1957~.
- SINANOGLU, SUAT (Turkey) b. 1918. Ph.D., Univ. of Ankara 1943. Intercultural Understanding (H). Appointed from Univ. of Ankara. *Places of Study:* England, Canada, 1957~.
- SINGH, JAG DEVA (India) b. 1915. M.A., Govt. Coll., Lahore, 1938. Intercultural Understanding (H). Appointed from Punjab Education Dept. *Place of Study:* U.S.A., 1957~.

- SINGH, MADAN MOHAN (India)** b. 1923. M.D., Harvard Univ. 1951. Medical Education (MEPH). Appointed while in training at Univ. Coll. Hosp., London. *Place of Study:* India, 1957~.
- SINGH SIDHU, BHAG (India)** b. 1929. M.S., Khalsa Coll., Punjab Univ., Amritsar, 1953. Plant Science—Genetics (A). Appointed from Govt. Coll., Rupar. *Place of Study:* U.S.A., 1957~.
- SINKOVICS, JOSEPH (Hungary)** b. 1924. Péter Pázmány Univ. of Budapest. Virus Research (HRP). *Place of Study:* U.S.A., 1957~.
- SOCHER, KARL FRIEDRICH (Austria)** b. 1928. Ph.D., Univ. of Vienna 1953. Economics (SS). Appointed from Inst. for Economic Research, Vienna. *Place of Study:* U.S.A., 1957~.
- SOUTHWORTH, FRANKLIN CHES-  
TER, III (United States)** b. 1929. B.A., Harvard Univ. 1951. Intercultural Understanding (H). Appointed twice while student at Yale Univ. *Place of Study:* U.S.A., 1956; 1957~.
- SRINIVASAGAM, VIOLET JOTHIBAI (India)** b. 1930. B.S., Christian Med. Coll., Vellore, 1951. Nursing Education (MEPH). Appointed from Christian Med. Coll. *Place of Study:* U.S.A., 1957~.
- SUNDARESAN, DEVADASON (India)** b. 1925. M.S., Kansas State Coll. 1953. Animal Science—Breeding (A). Appointed from Allahabad Agric. Inst. *Place of Study:* U.S.A., 1957~.
- SUZUKI, YOSHISUKE (Japan)** b. 1919. Nogakuhakushi, Tokyo Univ. 1956. Veterinary Science (A). Appointed from Tokyo Univ. *Place of Study:* U.S.A., 1957~.
- SZENTIVANYI, ANDOR (Hungary)** b. 1925. M.D., Univ. of Debrecen 1950. Immunology (BMR). *Place of Study:* U.S.A., 1957~.
- SZREBNIAWSKI, ZBIGNIEW (Poland)** b. 1921. M.D., Univ. of Warsaw 1949. Pharmacology (MEPH). Appointed from Med. Acad., Warsaw. *Place of Study:* U.S.A., 1957~.
- SZYMONA, MARIAN E. (Poland)** b. 1925. M.D., Marie Curie Skłodowska Univ., Lublin, 1952. Biochemistry—Enzymes (BMR). Appointed from Marie Curie Skłodowska Univ. *Place of Study:* U.S.A., 1957~.
- TACHI, RYUICHIRO (Japan)** b. 1921. Gakushi, Tokyo Univ. 1944. Economics (SS). Appointed from Tokyo Univ. *Place of Study:* U.S.A., 1957~.
- TAFURI, WASHINGTON LUIZ (Brazil)** b. 1926. M.D., Univ. of Minas Gerais, Belo Horizonte, 1956. Experimental Biology—Neuropathology (BMR). Appointed from Univ. of Minas Gerais. *Place of Study:* Germany, 1957~.
- TAKAGI, HIROSHI (Japan)** b. 1924. Igakuhakushi, Kyoto Univ. 1953. Biochemistry — Pharmacology (BMR). Appointed from Kyoto Univ. *Place of Study:* U.S.A., 1957~.
- TAKAHASHI, MAN-EMON (Japan)** b. 1918. M.S., Hokkaido Univ., Sapporo, 1940. Plant Breeding (A). Appointed from Hokkaido

- Univ. *Place of Study:* U.S.A., 1957~.
- TAKEDA, AKIRA (*Japan*) b. 1921. Ph.D., Kyoto Univ. 1956. Plant Science—Physiology (A). Appointed from Okayama Univ. *Place of Study:* U.S.A., 1957~.
- TANIGUCHI, SHIN-ICHI (*Japan*) b. 1915. Nogakusho, Hokkaido Univ., Sapporo, 1939. Forestry (A). Appointed from Hokkaido Univ. *Place of Study:* U.S.A., 1957~.
- APIA (YÁÑEZ), José ERNESTO (*Chile*) b. 1930. D.V.M., Univ. of Chile, Santiago, 1954. Animal Science — Breeding (A). Appointed from Univ. of Chile. *Place of Study:* U.S.A., 1957~.
- THOMAS, ELIZABETH (*India*) b. 1926. M.B.B.S., Christian Med. Coll., Vellore, 1949. General Pathology (MEPH). Appointed from Christian Med. Coll. *Place of Study:* U.S.A., 1957~.
- THOMAS, RENÉ PAUL ÉMILE (*Belgium*) b. 1928. Ph.D., Univ. of Brussels 1952. Biochemistry — Microbiology (BMR). Appointed from Belgian Natl. Foundation for Scientific Research, Brussels. *Place of Study:* U.S.A., 1957~.
- TJØNN, HANS HERMAN (*Norway*) b. 1917. M.D., Univ. of Oslo 1947. Public Health (MEPH). Appointed from Ministry of Health, Oslo. *Place of Study:* U.S.A., 1957~.
- TOHA CASTELLA, JOSÉ (*Chile*) b. 1923. M.D., Univ. of Chile, Santiago, 1947. Experimental Biology — Biophysics — Isotopes (BMR). Appointed from Univ. of Chile. *Place of Study:* U.S.A., 1957~.
- TRAMEZZANI, JUAN HUMBERTO (*Argentina*) b. 1928. M.D., Univ. of Buenos Aires 1952. Biology — Neuroendocrinology (BMR). Appointed from Univ. of Buenos Aires. *Place of Study:* U.S.A., 1957~.
- TSUKADA, YASUZO (*Japan*) b. 1922. D.Med.Sc., Keio Univ., Tokyo, 1953. Biochemistry—Intermediate Metabolism (BMR). Appointed from Keio Univ. *Place of Study:* U.S.A., 1957~.
- UMEMURA, MATAJI (*Japan*) b. 1921. Kyushu Univ., Fukuoka, 1942-45. Economics (SS). Appointed from Hitotsubashi Univ., Tokyo. *Place of Study:* U.S.A., 1957~.
- USMANBAS, İLHAN (*Turkey*) b. 1922. Grad., Natl. Conservatory of Ankara 1948. Music (H). Appointed from Natl. Conservatory of Ankara. *Place of Study:* U.S.A., 1957~.
- UZGÖREN, NAKİBE (*Turkey*) b. 1915. Ph.D., Univ. of Istanbul 1952. Statistics (SS). Appointed from Univ. of Istanbul and Robert Coll., Istanbul. *Place of Study:* U.S.A., 1957~.
- VÁGI, STEFAN (*Argentina*) b. 1930. E.E., Univ. of Buenos Aires 1957. Mathematics (BMR). Appointed from Univ. of Buenos Aires. *Place of Study:* U.S.A., 1957~.
- VÁLI, FRANCIS ALBERT (*Hungary*) b. 1905. Ph.D., London School of Economics and Political Science 1932. International Law (HRP). *Place of Study:* U.S.A., 1957~.
- VAN DER MARCK, JAN H. M. (*Netherlands*) b. 1929. Ph.D.,

- Roman Catholic Univ. of Nijmegen 1948. Visual Arts (H). Appointed while teaching at Lyceum voor Meisjes OLV ter Eem, Amersfoort. *Place of Study:* U.S.A., 1957-.
- VAN GESSEL, BEATRICE (Switzerland) b. 1921. H.M.I., Inselhof, Zurich, 1946. Nursing Education (MEPH). Appointed from Le Bon Secours School of Nursing, Geneva. *Place of Study:* U.S.A., 1957-.
- VAS, ISTVAN (Hungary) b. 1926. M.D., Univ. of Budapest 1950. Biology—Immunology (HRP). *Place of Study:* Canada, 1957-.
- VERA, ORESTES CRISTIÁN LARRAGUÍBEL (Chile) b. 1926. M.D., Univ. of Chile, Santiago, 1953. Neurosurgery and Neurophysiology (MEPH). Appointed from Catholic Univ. of Chile, Santiago. *Place of Study:* Canada, 1957-.
- VIEIRA, ENIO CARDILLO (Brazil) b. 1933. M.D., Univ. of Minas Gerais, Belo Horizonte, 1956. Basic Medical Sciences (MEPH). Appointed from Univ. of Minas Gerais. *Place of Study:* U.S.A., 1957-.
- VILLEGRAS HERNÁNDEZ, ALBERTO (Colombia) b. 1930. M.D., D.Ch., Univ. of Antioquia, Medellín, 1956. Cardiovascular Surgery (MEPH). Appointed while on scholarship at Shotley Bridge General Hosp., Consett, England. *Place of Study:* U.S.A., 1957-.
- VODANOVIC PISTELLI, SERGIO (Chile) b. 1926. Lawyer, Univ. of Chile, Santiago, 1951. Drama (H). *Place of Study:* U.S.A., 1957-.
- VON DIETRICH, HANS (Germany) b. 1923. Dr.rer.nat., Univ. of Heidelberg 1956. Biophysics—X-ray Crystallography (BMR). Appointed from Univ. of Heidelberg. *Place of Study:* England, 1957-.
- VON SYDOW, CHRISTIAN FREDRIK ERIK (Sweden) b. 1930. Ph.D., Univ. of Uppsala 1956. Biophysics—X-ray Crystallography (BMR). Appointed from Univ. of Uppsala. *Place of Study:* U.S.A., 1957-.
- WATANABE, GEN-ICHI (Japan) b. 1916. D.Med.Sc., Keio Univ., Tokyo, 1949. Public Health (MEPH). Appointed from Niigata Univ. *Place of Study:* U.S.A., 1957-.
- WATANABE, HIROSHI (Japan) b. 1924. D.Med.Sc., Keio Univ., Tokyo, 1955. Pathology (MEPH). Appointed from Keio Univ. *Place of Study:* U.S.A., 1957-.
- WEBSTER, GEOFFREY ROBSON (United Kingdom) b. 1920. B.Ch., Univ. of Oxford 1951. Biochemistry (BMRC). Appointed from Guy's Hosp. Med. School, London. *Place of Study:* U.S.A., 1957-.
- WEINBREN, MAURICE PAUL (Uganda) b. 1923. L.R.C.P., Middlesex Hosp., London, 1951. Biology—Virology (BMR). Appointed from East African Virus Research Inst., Entebbe. *Places of Study:* Colombia, U.S.A., 1957-.
- WHITTEMURY, GUILLERMO (Peru) b. 1929. M.D., Univ. of San Marcos, Lima, 1955. Basic

Medical Sciences (MEPH). Appointed from Univ. of San Marcos. *Place of Study:* U.S.A., 1957-.

YAMAUCHI, Toyoji (*Japan*) b. 1919. M.S., Kyoto Univ. 1942. Agricultural Economics (SS). Appointed from Natl. Research Inst. of Agric., Tokyo. *Place of Study:* U.S.A., 1957-.

YASA, MEMDUH (*Turkey*) b. 1919. Ph.D., Univ. of Istanbul 1946. Economics (SS). Appointed from Univ. of Istanbul. *Place of Study:* U.S.A., 1957-.

Zydowno, MARIUSZ (*Poland*) b. 1925. M.D., Med. Acad., Gdansk, 1951. Biochemistry (BMR). Appointed from Med. Acad. *Place of Study:* England, 1957-.

#### OTHER STUDY AWARDS

In addition to its fellowship appointments in 1957, the Foundation made under the regular and expanded programs 81 special study awards to persons from 17 countries.

AGUILAR YÉPEZ, SAMUEL (*Mexico*) b. 1929. Ing. Agr., Natl. School of Agric., Chapingo, 1954. Soil Science (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957-.

AGUILERA AMEZCUA, AUGUSTO (*Mexico*) b. 1933. Ing. Agr., Natl. School of Agric., Chapingo, 1957. Animal Science—Nutrition (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957-.

ALDJUPPRY, IDRUS (*Indonesia*) b. 1920. Intercultural Understanding (H). Appointed from Free Islamic Trade Union Congress, Sukabumi. *Place of Study:* U.S.A., 1957-.

ALL, MOHAMMAD (*Indonesia*) b. 1921. Intercultural Understanding (H). Appointed from All Indonesia Bank Workers Union,

Djakarta. *Place of Study:* U.S.A., 1957-.

AMARAL, ERICO (*Brazil*) b. 1919. D.Agr., Luiz de Queiroz Coll. of Agric., Piracicaba, 1953. Animal Science—Entomology (A). Appointed from Luiz de Queiroz Coll. of Agric. *Place of Study:* U.S.A., 1957-.

ARVIZU ROSALES, ZEFERINO (*Mexico*) b. 1929. Ing. Agr., Antonio Narro Coll. of Agric., Saltillo, 1957. Soil Science (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957-.

BARIUN, SIREGAR (*Indonesia*) b. 1917. Intercultural Understanding (H). Appointed from Organization of Indonesian Plantation Workers, Medan. *Place of Study:* U.S.A., 1957-.

BENAVIDES GÓMEZ, ALEJANDRO MARCIAL (*Colombia*) b. 1928.

Ing. Agr., Univ. of Nariño, Pasto, 1954. Plant Science—Entomology (A). Appointed from Dept. of Agric. Research, Palmira. *Place of Study:* U.S.A., 1957~.

CABRERA IPORRE, MÁXIMO (*Bolivia*) b. 1927. Ing. Agr., Univ. of San Simón, Cochabamba, 1951. Plant Science—Pathology (A). Appointed from Inter-American Agric. Service Experiment Station, Cochabamba. *Place of Study:* U.S.A., 1957~.

CANDIA ZEBALLOS, DANIEL (*Bolivia*) b. 1930. Ing. Agr., Univ. of San Simón, Cochabamba, 1956. Plant Science — Parasitology (A). Appointed from Univ. of San Simón. *Place of Study:* Mexico, 1957~.

CASSALETT DÁVILA, CLÍMACO (*Colombia*) b. 1926. Ing. Agr., Natl. Univ. of Colombia, Medellín, 1952. Plant Science—Breeding and Genetics (A). Appointed from Montería Experiment Station. *Place of Study:* U.S.A., 1957~.

CHANG, ER-CHANG (*National Republic of China*) b. 1921. LL.B., Natl. Chengchi Univ., Nanking, 1946. Statistics (SS). Appointed from Ministry of the Interior, Taipei. *Place of Study:* U.S.A., 1957~.

CHINDAVANIG, SUPIS (MRS. PAU) (*Thailand*) b. 1927. M.S., Univ. of Med. Sciences, Bangkok, 1955. Biochemistry — Nutrition (A). Appointed from Kasetsart Univ., Bangkok. *Place of Study:* U.S.A., 1957~.

CRUZ, LEVY PORFIRIO DA (*Brazil*) b. 1924. M.S., School of Sociol-

ogy and Politics of São Paulo 1951. Sociology (SS). Appointed from School of Sociology and Politics of São Paulo. *Place of Study:* U.S.A., 1957~.

DE SILVA, MERVYN DOMINIC (*Ceylon*) b. 1930. B.S., Univ. of Ceylon, Peradeniya, 1954. Plant Science—Entomology (A). Appointed from Dept. of Agric., Peradeniya. *Place of Study:* U.S.A., 1957~.

DJAFAR, MUHAMAD ISHAK (*Indonesia*) b. 1925. Veterinarian, Univ. of Indonesia, Bogor, 1954. Animal Science—Dairy Science (A). Appointed from Univ. of Indonesia and Bureau of Land Utilization, Bogor. *Place of Study:* U.S.A., 1957~.

FAROUQI, ZIA-UL-HASAN (*India*) b. 1925. M.A., Univ. of Allahabad 1950. Political Science (SS). Appointed from Jamia Millia Islamia, New Delhi. *Place of Study:* Canada, 1957~.

FERNÁNDEZ GONZALES, RAMÓN (*Mexico*) b. 1931. Ing. Agr., Natl. School of Agric., Chapingo, 1957. Soil Science (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957~.

FLORES CÁCERES, SILVERIO (*Mexico*) b. 1918. Ing. Agr., Natl. School of Agric., Chapingo, 1946. Plant Science — Parasitology (A). Appointed from Natl. School of Agric. and Natl. Union of Sugar Producers, Mexico City. *Place of Study:* U.S.A., 1957~.

GALARRAGA GALARRAGA, JOSÉ RAFAEL (*Ecuador*) b. 1917. Agron-

- omist, Natl. School of Agric. 1940. Plant Science — Genetics (A). Appointed from Natl. Wheat Commission Experiment Station, Izobamba. *Place of Study:* Ecuador, 1957-.
- GALINDO ALONSO, JORGE** (*Mexico*) b. 1931. Ing. Agr., Natl. School of Agric., Chapingo, 1954. Plant Science—Pathology (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957-.
- GAONA RODRIGUEZ, HOMERO** (*Mexico*) b. 1930. Ing. Agr., Antonio Narro Coll. of Agric., Saltillo, 1953. Plant Science—Pathology (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957-.
- GOES, EDIVALDO SOBRAL DE** (*Brazil*) b. 1929. Eng. Agr., Rural Univ., Rio de Janeiro, 1956. Soil Science (A). *Place of Study:* Mexico, 1957-.
- GONZÁLEZ BUENO, RODOLFO** (*Chile*) b. 1923. Ing. Agr., Univ. of Chile, Santiago, 1948. Plant Science — Genetics (A). Appointed from Ministry of Agric., Santiago. *Place of Study:* U.S.A., 1957-.
- HARDJODARSONO, MOHAMMAD SUNARJO** (*Indonesia*) b. 1925. Cert., Fakultas Pertanian, Bogor, 1955. Forestry (A). Appointed from Fakultas Pertanian. *Place of Study:* U.S.A., 1957-.
- HAYAMI, YUJIRO** (*Japan*) b. 1932. B.S., Tokyo Univ. 1956. Agricultural Economics (SS). Appointed from Natl. Research Inst. of Agric., Tokyo. *Place of Study:* U.S.A., 1957-.
- HEMMI, KENZO** (*Japan*) b. 1923. B.S., Tokyo Univ. 1947. Agricultural Economics (SS). Appointed from Natl. Research Inst. of Agric., Tokyo. *Place of Study:* U.S.A., 1957-.
- HERNAWA, IKIN ASJIKIN** (*Indonesia*) b. 1925. Cert., Higher Training School for Teachers, Bandung, 1952. Intercultural Understanding (H). Appointed from (1) private elementary school, (2) Indonesian Teachers Union, West Java. *Place of Study:* U.S.A., 1957-.
- HERRÁN RAMÍREZ, INÉS** (*Colombia*) b. 1933. Library Science (MEPH). Appointed from Univ. of Valle, Cali. *Place of Study:* U.S.A., 1957-.
- INTRAMA, SIRIPHONG** (*Thailand*) b. 1929. B.S., Kasetsart Univ., Bangkok, 1954. Plant Science—Pathology (A). Appointed from Kasetsart Univ. *Place of Study:* U.S.A., 1957-.
- IRABAGON, TEODORO A.** (*Philippines*) b. 1925. B.S., Univ. of the Philippines, College, Laguna, 1949. Animal Science—Economic Entomology (A). Appointed from Central Luzon Agric. Coll., Nueva Ecija. *Place of Study:* U.S.A., 1957-.
- ISMAIL, HAMID NASHAT** (*Iraq*) b. 1928. B.S., Cornell Univ. 1953. Soil Science (A). Appointed from Experiment Station, Abu-Ghraib. *Place of Study:* U.S.A., 1957-.
- JAFRI, MOHAMMAD HARIS** (*Pakistan*) b. 1929. M.A., Univ. of California 1955. Economics (SS). Appointed from Inst. of Inter-

natl. Studies, Univ. of California. *Place of Study:* U.S.A., 1957~.

KANJANASOON, PRAKOB (*Thailand*) b. 1924. Assoc., Indian Agric. Research Inst., New Delhi, 1953. Plant Science—Pathology (A). Appointed from Ministry of Agric., Bangkok. *Place of Study:* U.S.A., 1957~.

KHOURY, MOUNIR HABIB (*Lebanon*) b. 1920. M.S., Cornell Univ. 1954. Rural Sociology (SS). Appointed from American Univ. of Beirut. *Place of Study:* U.S.A., 1957~.

KITA, FUMIJI (*Japan*) b. 1925. Nogakushi, Hokkaido Univ., Sapporo, 1949. Plant Science—Genetics (A). Appointed from Hokkaido Univ. *Place of Study:* U.S.A., 1957~.

KOHASHI SHIBATA, JOSUÉ (*Mexico*) b. 1926. Ing. Agr., Natl. School of Agric., Chapingo, 1957. Plant Science—Genetics (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957~.

LAUW, BENG HIEN (*Indonesia*) b. 1926. Intercultural Understanding (H). Appointed from Aviation Workers Union, Djakarta. *Place of Study:* U.S.A., 1957~.

MAHMOOD, ABU NASR MUHAMMAD (*Pakistan*) b. 1920. M.A., Univ. of Dacca 1942. Economics (SS). Appointed from Univ. of Dacca. *Place of Study:* U.S.A., 1957~.

MARAYATI, ABID AMIN AL- (*Iraq*) b. 1931. M.A., Bradley Univ.

1954. Political Science (SS). Appointed from Delegation of Yemen to the United Nations, on leave from Iraq Ministry of Education, and while a student at New York Univ. *Place of Study:* U.S.A., 1957~.

MARUANAJA, PIETER DIRK (*Indonesia*) b. 1925. Intercultural Understanding (H). Appointed from Postal, Telegraph, and Telephone Union, Ambon. *Place of Study:* U.S.A., 1957~.

MENDOZA, ELEUTERIO DEL MUNDO (*Philippines*) b. 1933. B.S., Univ. of the Philippines, College, Laguna, 1955. Plant Science—Pathology (A). Appointed from Forest Products Lab., College, Laguna. *Place of Study:* U.S.A., 1957~.

MOERJONO, HARRY (*Indonesia*) b. 1928. B.S., Feati Inst. of Tech., Manila, 1956. Engineering—Aeronautics (A). Appointed from Dept. of Civil Aviation, Djakarta. *Place of Study:* U.S.A., 1957~.

MORA GONZÁLEZ, SERGIO (*Chile*) b. 1929. Ing. Agr., Univ. of Chile, Santiago, 1955. Plant Science—Breeding (A). Appointed from Experiment Station, Rinconada. *Place of Study:* U.S.A., 1957~.

MÚÑOZ GARZA, JUAN MANUEL (*Mexico*) b. 1931. Ing. Agr., Antonio Narro Coll. of Agric., Saltillo, 1953. Plant Science—Genetics (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957~.

NASUTION, AMIRUDDIN (*Indonesia*) b. 1926. Sardjana Muda, Univ. of North Sumatra, Me-

- dan, 1955. Intercultural Understanding (H). Appointed from Democratic Labor Union of Indonesia. *Place of Study:* U.S.A., 1957~.
- NIMGADE, NAMDEO MAROTRAO (*India*) b. 1925. Assoc., Indian Agric. Research Inst., New Delhi, 1951. Soil Science (A). Appointed from Indian Agric. Research Inst. *Place of Study:* U.S.A., 1957~.
- OÑATE, BURTON T. (*Philippines*) b. 1921. M.S., Iowa State Coll. 1952. Statistics (SS). Appointed from Natl. Economic Council. *Place of Study:* U.S.A., 1957~.
- PANDJAITAN, BONAR (*Indonesia*) b. 1923. Intercultural Understanding (H). Appointed from (1) Caltex Oil Labor Union, Sungai Rumbai, Pakanbaru, Sumatra, (2) Caltex Pacific Petroleum Company at Rumbai, Sumatra. *Place of Study:* U.S.A., 1957~.
- PATERNIANI, ERNESTO (*Brazil*) b. 1928. D.Agr., Luiz de Queiroz Coll. of Agric., Piracicaba, 1954. Plant Science—Breeding (A). Appointed from Luiz de Queiroz Coll. of Agric. *Place of Study:* U.S.A., 1957~.
- PEIXOTO, ARISTEU MENDES (*Brazil*) b. 1926. Eng. Agr., Luiz de Queiroz Coll. of Agric., Piracicaba, 1949. Animal Science—Nutrition (A). Appointed from Luiz de Queiroz Coll. of Agric. *Place of Study:* U.S.A., 1957~.
- PÉREZ RINCÓN, RUBÉN (*Mexico*) b. 1923. Ing. Agr., Natl. School of Agric., Chapingo, 1949. Plant Science—Pathology (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957~.
- PETTA, ANTONIO (*Brazil*) b. 1925. D.Agr., Luiz de Queiroz Coll. of Agric., Piracicaba, 1954. Agricultural Engineering (A). Appointed from Luiz de Queiroz Coll. of Agric. *Place of Study:* U.S.A., 1957~.
- RAM, DIP NARAYAN (*India*) b. 1930. B.S.Agr., Bihar Agric. Coll., Bhagalpur, 1952. Plant Science—Agronomy (A). Appointed from Field Experimental Service, Dept. of Agric., Bihar. *Place of Study:* U.S.A., 1957~.
- RAMANUJAM, SRINIVASA (*India*) b. 1925. B.S., Univ. of Madras 1945. Plant Science — Plant Breeding (A). Appointed from Indian Agric. Research Inst., New Delhi. *Place of Study:* U.S.A., 1957~.
- RAMIREZ, DOLORES ALTOVEROS (*Philippines*) b. 1920. B.S., Univ. of the Philippines, College, Laguna, 1956. Plant Science—Genetics (A). Appointed from Univ. of the Philippines. *Place of Study:* U.S.A., 1957~.
- RAMÍREZ RAMÍREZ, RICARDO (*Bolivia*) b. 1932. Ing. Agr., Univ. of San Simón, Cochabamba, 1956. Soil Science (A). Appointed from Univ. of San Simón. *Place of Study:* Mexico, 1957~.
- REVELO PEPINOSA, MIGUEL ANTONIO (*Colombia*) b. 1929. Ing. Agr., Univ. of Nariño, Pasto, 1957. Plant Science—Entomology (A). Appointed from Tibaitatá Experiment Station, Bogotá. *Place of Study:* U.S.A., 1957~.

- ROCHA, FLAVIO FARIA (Brazil) b.** 1923. Eng. Agr., Eliseu Maciel School of Agron., Pelotas, 1945. Plant Science — Horticulture (A). Appointed from Agron. Inst. of the South, Pelotas. *Place of Study:* U.S.A., 1957~.
- RODRIGUES, LINCOLN MONTEIRO (Brazil) b.** 1911. Eng. Agr., Coll. of Agric., Viçosa, 1936. Rural Sociology and Agricultural Economics (A). Appointed from Ministry of Agric., Rio de Janeiro. *Place of Study:* U.S.A., 1957~.
- RODRIGUEZ GARCIA, ARIEL (Mexico) b.** 1933. Ing. Agr., Antonio Narro Coll. of Agric., Saltillo, 1955. Plant Science—Pathology (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957~.
- ROMERO FRANCO, JULIO (Bolivia) b.** 1931. Ing. Agr., Univ. of San Simón, Cochabamba, 1956. Plant Science (A). Appointed from La Tamborada Experiment Station, Cochabamba. *Place of Study:* Mexico, 1957~.
- RONDÓN OLAZABAL, MARIO (Peru) b.** 1931. Ing. Agr., Natl. School of Agric., La Molina, Lima, 1955. Plant Science — Genetics and Plant Breeding (A). Appointed from Natl. School of Agric. *Place of Study:* Mexico, 1957~.
- RUANOVA HERNÁNDEZ, ALFONSO (Mexico) b.** 1932. Ing. Agr., Antonio Narro Coll. of Agric., Saltillo, 1956. Agricultural Extension (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957~.
- SACHS, SERGIO (Brazil) b.** 1930. Univ. of Rio Grande do Sul, Pôrto Alegre. Plant Science—Genetics (A). Appointed from Secretariat of Agric., State of Rio Grande do Sul. *Place of Study:* U.S.A., 1957~.
- SALAZAR BLACUD, ANGEL (Bolivia) b.** 1929. Ing. Agr., Univ. of San Simón, Cochabamba, 1957. Plant Science—Genetics (A). Appointed from Tech. Agric. Service of Nicaragua, Managua. *Place of Study:* U.S.A., 1957~.
- SALMAN, MUHSIN HUSSAIN AL- (Iraq) b.** 1920. B.S., Michigan State Univ. 1954. Education (A). Appointed from Coll. of Agric., Abu-Ghraib. *Place of Study:* U.S.A., 1957~.
- SÁNCHEZ DURÓN, ARTURO (Mexico) b.** 1930. Pasante, School of Agric., Cd. Juárez, 1954. Plant Science — Agronomy (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957~.
- SANTOS, CLOVIS FERRAZ DE OLIVEIRA (Brazil) b.** 1923. D.Agr., Luiz de Queiroz Coll. of Agric., Piracicaba, 1954. Plant Science—Botany (A). Appointed from Luiz de Queiroz Coll. of Agric. *Place of Study:* U.S.A., 1957~.
- SEETHARAMAN, RAMASWAMY (India) b.** 1927. M.S., Science Coll., Benares, 1950. Plant Science—Plant Breeding and Genetics (A). Appointed from Central Rice Research Inst., Cuttack. *Place of Study:* U.S.A., 1957~.
- SIERRA, JOSÉ ANTONIO (Colombia) b.** 1924. Ing. Agr., Natl. Univ. of Colombia, Medellin. Plant Science—Genetics (A). Appointed

- from Tibaitatá Experiment Station, Bogotá. *Place of Study:* U.S.A., 1957-.
- SIERRA CASASÚS, CATALINA** (*Mexico*) b. 1916. M.A., Col. de México, Mexico City, 1948. Sociology (SS). Appointed from Nacional Financiera, Mexico City. *Place of Study:* U.S.A., 1957-.
- SHOJI, SADAO** (*Japan*) b. 1931. B.S., Tohoku Univ., Sendai, 1954. Soil Science (A). Appointed from Hokkaido Natl. Agric. Experiment Station, Kotoni, Sapporo. *Place of Study:* U.S.A., 1957-.
- SKAPSKI, HENRYK** (*Poland*) b. 1933. M.S., Central School of Rural Economics, Warsaw, 1955. Plant Science — Horticulture (A). Appointed from Polish Acad. of Sciences, Lab. of Biology of Vegetable Plants, Skieriewice. *Place of Study:* U.S.A., 1957-.
- SOEMANTRI WARGADINATA, RADEN** (*Indonesia*) b. 1920. Intercultural Understanding (H). Appointed from Railway Workers Union, Bandung. *Place of Study:* U.S.A., 1957-.
- SUWASKITA, APNAN** (*Indonesia*) b. 1926. Intercultural Understanding (H). Appointed from Oil Workers Union, Djakarta. *Place of Study:* U.S.A., 1957-.
- TÉLIZ ORTIZ, Moisés** (*Mexico*) b. 1931. Ing. Agr., Natl. School of Agric., Chapingo, 1956. Plant Science — Pathology (A). Appointed from Office of Special Studies, Mexico City. *Place of Study:* U.S.A., 1957-.
- TORREGROZA CASTRO, MANUEL** (*Colombia*) b. 1926. Agric. Coll., Medellin, 1948-51. Plant Science — Genetics (A). Appointed from Tibaitatá Experiment Station, Bogotá. *Place of Study:* U.S.A., 1957-.
- VASIL, RAJ KUMAR** (*India*) b. 1931. M.A., Univ. of Lucknow 1953. International Affairs (SS). Appointed from Indian School of Internatl. Studies, New Delhi. *Place of Study:* U.S.A., 1957-.
- WAHAB, ABDUL** (*Indonesia*) b. 1922. Intercultural Understanding (H). Appointed from Qantas Empire Airways Labour Union. *Place of Study:* U.S.A., 1957-.
- ZIOLECKI, ALEKSANDER ROMAN** (*Poland*) b. 1924. M.Agr.Sc., Univ. of Poznan 1951. Microbiology—Bacteriology (A). Appointed from Inst. of Animal Physiology and Nutrition, Bydgoszcz. *Place of Study:* England, 1957-.

## **Report of the Treasurer**



# REPORT OF THE TREASURER

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**I**N THE FOLLOWING PAGES is submitted a report of the financial transactions of The Rockefeller Foundation for the year ended December 31, 1957.

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SQUIRES & COMPANY  
CERTIFIED PUBLIC ACCOUNTANTS  
101 PARK AVENUE, NEW YORK 17

*February 25, 1958*

ACCOUNTANTS' CERTIFICATE

To the Board of Trustees of  
The Rockefeller Foundation:

We have examined the balance sheet of The Rockefeller Foundation as of December 31, 1957, and the related statements of its unappropriated and appropriated funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

The accounting records are kept on a cash basis and, accordingly, no effect has been given in the accompanying statements to income accrued but not received at December 31, 1957, nor to expenditures made from advances for which reports had not been received at the time the books were closed for the year.

In our opinion, with the foregoing explanation, the accompanying balance sheet and statements of unappropriated and appropriated funds present fairly the financial position of The Rockefeller Foundation as of December 31, 1957, and the results of its financial activities during the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

(Signed) Squires & Company

## BALANCE SHEET — DECEMBER 31, 1957

*ASSETS*

SECURITIES (Ledger value)	\$200,462,130.66
(Market value \$550,426,316.25)	
<b>CURRENT ASSETS:</b>	
Cash on deposit	5,537,468.17
Advances and deferred charges	\$645,366.54
Sundry accounts receivable	<u>17,440.35</u>
	662,806.89
<b>OFFICE AND EQUIPMENT:</b>	
In New York and Paris	194,154.43
	<u>\$206,856,560.15</u>

*FUNDS AND OBLIGATIONS*

PRINCIPAL FUND	\$142,401,485.58
<b>COMMITMENTS:</b>	
Unpaid appropriations	\$57,010,851.96
Unappropriated authorizations	<u>715,924.00</u>
	57,726,775.96
INCOME AVAILABLE FOR COMMITMENT	6,464,161.56
<b>CURRENT LIABILITIES:</b>	
Accounts payable	69,982.62
OFFICE AND EQUIPMENT FUND	194,154.43
	<u>\$206,856,560.15</u>

**PRINCIPAL FUND**

Balance, December 31, 1956	\$162,426,294.30
Add:	
Gift received: Anonymous	15,000.00
	<hr/>
Deduct:	
Amount transferred to Income Account in accordance with action taken by Trustees at meeting of December 3-4, 1957	\$20,000,000.00
Amount by which the proceeds of securities sold during the year failed to equal the ledger value	39,808.72
	<hr/>
Balance, December 31, 1957	\$142,401,485.58

**APPROPRIATIONS AND PAYMENTS**

Unpaid appropriations, December 31, 1956	\$41,743,760.04
Appropriations during the year:	
Medical Education and Public Health	\$ 8,298,260.00
Biological and Medical Research	5,255,235.00
Agriculture	5,621,400.00
Social Sciences	3,570,525.00
Humanities	10,873,670.00
General	6,466,710.00
Administration	2,713,116.00
	<hr/>
Unused balance of appropriations allowed to lapse	\$42,798,916.00
	<hr/>
	1,183,913.76
	<hr/>
	41,615,002.24
	<hr/>
	\$33,358,762.28

APPROPRIATIONS AND PAYMENTS — *concluded*

Payments on 1957 and prior years' appropriations:

Medical Education and Public Health	\$ 5,813,352.26
Biological and Medical Research	3,864,973.52
Agriculture	3,996,680.40
Social Sciences	2,488,132.75
Humanities	5,044,356.68
Former Program	41,885.76
General	2,647,675.38
Administration	2,450,853.57
	<u>26,347,910.32</u>

Unpaid appropriations, December 31, 1957

\$57,010,851.96

## UNAPPROPRIATED AUTHORIZATIONS

Balance, December 31, 1956	\$610,945.00
<i>Add:</i>	
Adjustment of Reserve for Retiring Allowances	104,979.00

Balance, December 31, 1957

\$715,924.00

## INCOME AVAILABLE FOR COMMITMENT

Balance, December 31, 1956	\$ 4,865,516.31
<i>Add:</i>	
Income and refunds:	
Income from securities	\$23,297,131.98
Refunds	21,494.51
Amount transferred from Principal Fund as of December 31, 1957	20,000,000.00
Unused balance of appropriations allowed to lapse	1,183,913.76
	<u>44,502,540.25</u>
	<u>\$49,368,056.56</u>
<i>Deduct:</i>	
Appropriations	\$42,798,916.00
Authorizations	104,979.00
Income available for commitment, December 31, 1957	<u>42,903,895.00</u>
	<u>\$ 6,464,161.56</u>

# OFFICE AND EQUIPMENT FUND

	BALANCE DEC. 31, 1956	CHANGES DURING 1957	BALANCE DEC. 31, 1957
	ADDITIONS	DEPRECIATION	
Library	\$ 10,125.00	\$ 2,563.07	\$ 9,029.00
Equipment	140,434.48	54,788.69	161,314.77
Paris Office:			
Part interest in Paris office building	<u>23,810.66</u>	<u>.....</u>	<u>23,810.66</u>
	<u>\$174,370.14</u>	<u>\$57,351.76</u>	<u>\$37,567.47</u>
			<u>\$194,154.43</u>

## APPROPRIATIONS AND UNAPPROPRIATED AUTHORIZATIONS

Commitments, December 31, 1956:

Unpaid appropriations	\$41,743,760.04
Unappropriated authorizations	610,945.00

Add:

Appropriations	\$42,798,916.00
Authorizations	104,979.00

Deduct:

Appropriations lapsed during the year	1,183,913.76
	<u>41,719,981.24</u>

\$84,074,686.28

Deduct:

Payments on 1957 and prior years' appropriations	26,347,910.32
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Commitments, December 31, 1957:

Unpaid appropriations	\$57,010,851.96
Unappropriated authorizations	715,924.00

\$57,726,775.96

**FINANCE COMMITTEE'S STATEMENT OF TRANSACTIONS RELATING TO INVESTED FUNDS**  
 FOR THE YEAR ENDED DECEMBER 31, 1957

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PURCHASED			
\$1,000,000	Consolidated Edison Co. of New York 4½% Conv. Deb. February 15, 1972 @ 109.25		\$1,092,500.00
1,000,000	General Motors Acceptance Corp. 5% 20 yr. Deb. August 15, 1977 @ 97.50		975,000.00
1,000,000	Illinois Bell Telephone Co. 4¼% "E" March 1, 1988 @ 101.384		1,013,840.00
1,000,000	The Mountain States Telephone & Telegraph Co. 4¾% 31 yr. Deb. February 1, 1988 @ 101.277		1,012,770.00
1,000,000	Pacific Gas & Electric Co. 4½% 1st & Ref. Mtge. "AA" December 1, 1986 @ 101.491875		1,014,918.75
272	shares Dow Chemical Co. Common (Par \$5) @ 59.279522		16,124.03
500	" International Business Machines Corp. Common (No Par) @ 220. plus the surrender of 5,000 rights		110,000.00
			<hr/> <u>\$5,235,152.78</u>

**OTHERWISE ACQUIRED**

150,000	shares Continental Oil Co. Capital (Par \$5) received in a stock split on 150,000 shares (Par \$5) owned of record 1/23/57	\$ — 0 —
420	" Dow Chemical Co. Common (Par \$5) received as a stock dividend on 21,000 shares (Par \$5) owned of record 9/25/57	— 0 —
300,000	rights Hudson Bay Oil & Gas Co. Ltd. received on 300,000 shares of Continental Oil Co. Capital (Par \$5) owned of record 9/16/57 @ .512331666	153,699.50
2,500	shares International Business Machines Corp. Common (No Par) received in a stock split on 2,500 shares (No Par) owned of record 5/7/57	— 0 —
5,000	rights International Business Machines Corp. received on 5,000 shares (No Par) owned of record 5/21/57	— 0 —
2,040	shares International Paper Co. Common (Par \$7.50) received as a stock dividend on 68,000 shares (Par \$7.50) owned of record 11/22/57	— 0 —

THE ROCKEFELLER FOUNDATION

620	" Monsanto Chemical Co. Common (Par \$2) received as a stock dividend on 31,212 shares (Par \$2) owned of record 11/25/57	— 0 —
23,100	" Peoples Gas Light & Coke Co. Common (Par \$25) received in a stock split on 7,700 shares (Par \$100) owned of record 4/10/57	— 0 —
300,000	rights Socony Mobil Oil Co., Inc. received on 300,000 shares of Socony Mobil Oil Co., Inc. Capital (Par \$15) owned of record 1/30/57 @ .484864633	145,459.39
14,285	shares Standard Oil Co. (New Jersey) Capital (Par \$7) received as a stock dividend on 1,000,000 shares Standard Oil Co. (Indiana) Capital (Par \$25) owned of record 11/13/57. Taken into the books at the sales price (@ 49.33874203	704,803.93
6,000,000	rights Standard Oil Co. (New Jersey) received on 6,000,000 shares (Par \$7) owned of record 11/8/57 @ .119883333	719,300.00
		\$1,723,262.82
		\$6,958,415.60

SOLD		PROCEEDS	LEDGER VALUE
\$1,000,000	United States of America 2½% Treasury Bonds June 15, 1958 @ 98.78125	\$ 987,812.50	\$ 1,000,000.00
4,400,000	United States of America 2% Treasury Notes August 15, 1957 @ 99.4133522	4,374,187.50	4,366,750.00
2,000,000	United States of America 2½% Treasury Notes "A" June 15, 1958 @ 99.265625	1,985,312.50	2,001,722.11
1,000,000	United States of America 1½% Treasury Notes April 1, 1960 @ 94.8125	948,125.00	956,875.00
6,000	shares Canadian Industries Limited Common (No Par) @ 18.4803236	110,552.48	132,426.58
300,000	rights Hudson Bay Oil and Gas Co. Ltd. @ .512331666	153,699.50	153,699.50
	134½ shares International Paper Co. Common (Par \$7.50) @ 106.309144	14,298.58	4,673.11

**FINANCE COMMITTEE'S STATEMENT OF TRANSACTIONS  
RELATING TO INVESTED FUNDS—*concluded***

		PROCEEDS	LEDGER VALUE
SOLD— <i>concluded</i>			
212	shares Monsanto Chemical Co. Common (Par \$2) @ 35.79490566	\$ 7,588.52	\$ 5,239.00
300,000	rights Socony Mobil Oil Co., Inc. @ .484864633	145,459.39	145,459.39
6,000,000	" Standard Oil Co. (New Jersey) @ .119883333	719,300.00	719,300.00
14,285	shares Standard Oil Co. (New Jersey) Capital (Par \$7) @ 49.33874203	704,803.93	704,803.93
		<hr/> <u>\$10,151,139.90</u>	<hr/> <u>\$10,190,948.62</u>
<b>OTHERWISE DISPOSED OF</b>			
5,000	rights International Business Machines Corp. surrendered upon subscription to 500 shares of Common (No Par)	\$ —0—	\$ —0—
		<hr/>	<hr/>
<b>LEDGER VALUE REDUCED</b>			
300,000	shares Continental Oil Co. Capital (Par \$5) by value of 300,000 rights of Hudson Bay Oil and Gas Co. Ltd. @ .512331666	\$ 153,699.50	
300,000	" Socony Mobil Oil Co., Inc. Capital (Par \$15) by value of 300,000 rights @ .484864633	145,459.39	
6,000,000	" Standard Oil Co. (New Jersey) Capital (Par \$7) by value of 6,000,000 rights @ .119883333	719,300.00	
<b>AMORTIZATION OF BOND PREMIUMS</b>		15,072.27	
		<hr/>	<hr/>
		\$ 1,033,531.16	
		<hr/>	<hr/>
		\$11,224,479.78	

## RECONCILIATION

Ledger Value of Securities December 31, 1956		\$204,728,194.84
Purchased	\$ 5,235,152.78	
Otherwise Acquired	<u>1,723,262.82</u>	<u>6,958,415.60</u>
		<u>\$211,686,610.44</u>
Sold	\$10,190,948.62	
Ledger Value Reduced	<u>1,033,531.16</u>	<u>11,224,479.78</u>
Ledger Value of Securities December 31, 1957		<u>\$200,462,130.66</u>

## SCHEDULE OF SECURITIES ON DECEMBER 31, 1957

BONDS	PAR	LEDGER VALUE		MARKET VALUE	
		PRICE	TOTAL	PRICE	TOTAL
American Telephone & Telegraph Co. 3 7/8% 34 yr. Deb. July 1, 1990	\$2,000,000	102.673	\$ 2,053,456.60	100.00	\$ 2,000,000.00
Consolidated Edison Co. of New York 4 1/2% Conv. Deb. February 15, 1972	1,000,000	109.019	1,090,191.81	110.50	1,105,000.00
Dallas Power & Light Co. 4 1/4% 1st Mtge. December 1, 1986	500,000	100.820	504,102.14	103.00	515,000.00
General Motors Acceptance Corp. 5% 20 yr. Deb. August 15, 1977	1,000,000	97.50	975,000.00	111.50	1,115,000.00
Illinois Bell Telephone Co. 4 1/4% Series "E" March 1, 1988	1,000,000	101.377	1,013,772.87	104.00	1,040,000.00

SCHEDULE OF SECURITIES — *continued*

BONDS— <i>concluded</i>	LEDGER VALUE			MARKET VALUE	
	PAR	PRICE	TOTAL	PRICE	TOTAL
International Bank for Reconstruction and Development 3½% October 15, 1971	\$1,000,000	98.00	\$ 980,000.00	95.50	\$ 955,000.00
Michigan Bell Telephone Co. 4¾% 35 yr. Deb. December 1, 1991	1,000,000	102.203	1,022,030.30	104.00	1,040,000.00
The Mountain States Telephone & Telegraph Co. 4¾% February 1, 1988	1,000,000	101.257	1,012,568.61	104.00	1,040,000.00
Pacific Gas & Electric Co. 4½% 1st & Ref. Mtge. "AA" December 1, 1986	1,000,000	101.451	1,014,511.46	106.25	1,062,500.00
Public Service Electric & Gas Company 4¾% 1st & Ref. Mtge. November 1, 1986	1,000,000	101.217	1,012,173.88	104.00	1,040,000.00
Scott Paper Company 3% Conv. Deb. March 1, 1971	1,000,000	103.899	1,038,987.26	97.125	971,250.00
United States of America Treasury Bonds:					
2½% — June 15, 1958	4,000,000	100.00	4,000,000.00	99.75	3,990,000.00
2½% — Dec. 15, 1958	1,000,000	100.00	1,000,000.00	99.71875	997,187.50
2½% — Sept. 15, 1956-59	11,000,000	99.330	10,926,250.00	99.03125	10,893,437.50
2½% — Sept. 15, 1961	1,920,000	100.00	1,920,000.00	99.875	1,917,600.00

$2\frac{1}{2}\%$ — Nov. 15, 1961	9,000,000	100.039	9,003,487.92	98.625	8,876,250.00
$2\frac{1}{2}\%$ — Aug. 15, 1963	11,000,000	99.460	10,940,554.94	98.125	10,793,750.00
$2\frac{1}{2}\%$ — June 15, 1962-67	11,200,000	98.739	11,058,762.94	96.375	10,794,000.00
$2\frac{1}{2}\%$ — Dec. 15, 1964-69	12,000,000	96.305	11,556,562.50	94.4375	11,332,500.00
$2\frac{1}{2}\%$ — June 15, 1967-72	9,000,000	98.941	8,904,650.50	93.375	8,403,750.00
United States of America $1\frac{7}{8}\%$ Treasury Notes February 15, 1959	8,000,000	100.096	8,007,701.75	99.0625	7,925,000.00
United States of America $1\frac{1}{2}\%$ Treasury Notes April 1, 1960	4,000,000	95.688	3,827,500.00	97.50	3,900,000.00
United States of America $2\frac{1}{2}\%$ Savings Bonds Series "G" October 1, 1962	1,000,000	100.00	1,000,000.00	96.10	961,000.00
			<u>\$93,862,265.48</u>		<u>\$92,668,225.00</u>

STOCKS	SHARES	LEDGER VALUE		MARKET VALUE	
		PRICE	TOTAL	PRICE	TOTAL
American Gas & Electric Co. (Par \$10)	61,200	\$17.567	\$ 1,075,084.95	\$39.375	\$ 2,409,750.00
American Telephone & Telegraph Co. Cap. (Par \$100)	24,750	134.976	3,340,668.24	167.50	4,145,625.00
Canadian Industries Limited (No par)	39,000	22.071	860,772.74	15.25	594,750.00
Christiana Securities Co. (Par \$100)	200	5,568.00	1,113,600.00	12,100.00	2,420,000.00

SCHEDULE OF SECURITIES—*continued*

STOCKS— <i>continued</i>	SHARES	LEDGER VALUE		MARKET VALUE	
		PRICE	TOTAL	PRICE	TOTAL
Consolidated Natural Gas Co. Cap. (Par \$10)	300,000	\$16.189	\$ 4,856,806.82	\$44.00	\$ 13,200,000.00
Continental Insurance Co. Cap. (Par \$5)	25,000	36.588	914,713.17	45.875	1,146,875.00
Continental Oil Co. Cap. (Par \$5)	300,000	6.718	2,015,418.15	42.875	12,862,500.00
Corning Glass Works (Par \$5)	12,500	35.593	444,917.79	82.00	1,025,000.00
Crown Zellerbach Corporation (Par \$5)	22,500	26.274	591,167.64	45.625	1,026,562.50
Dow Chemical Co. (Par \$5)	21,500	23.025	495,033.83	52.875	1,136,812.50
Fireman's Fund Insurance Co. Cap. (Par \$2.50)	25,000	52.540	1,313,499.89	43.25	1,081,250.00
First National Bank of Chicago (Par \$100)	6,700	174.611	1,169,895.85	302.00	2,023,400.00
Freeport Sulphur Co. (Par \$10)	30,000	74.396	2,231,877.90	70.50	2,115,000.00
General Electric Co. (Par \$5)	60,000	19.674	1,180,424.14	61.50	3,690,000.00
Goodrich, B. F. Co. (Par \$10)	50,000	36.798	1,839,893.41	66.75	3,337,500.00
Hartford Fire Insurance Co. Cap. (Par \$10)	25,000	87.141	2,178,527.78	127.00	3,175,000.00
Inland Steel Co. (No par)	10,000	74.95	749,507.83	73.25	732,500.00
Insurance Company of North America Cap. (Par \$5)	25,000	96.476	2,411,908.38	91.125	2,278,125.00

THE ROCKEFELLER FOUNDATION

International Business Machines Corp. (No par)	5,500	120.047	660,255.83	305.00	1,677,500.00
International Nickel Co. of Canada Ltd. (No par)	55,000	41.636	2,289,969.82	70.25	3,863,750.00
International Paper Co. (Par \$7.50)	70,040	33.732	2,362,615.30	86.25	6,040,950.00
Kennecott Copper Corporation (No par)	30,000	58.539	1,756,180.37	78.00	2,340,000.00
Monsanto Chemical Co. (Par \$2)	31,620	24.228	766,079.65	35.00	1,106,700.00
National Lead Co. (Par \$5)	15,300	48.811	746,805.13	96.25	1,472,625.00
The Ohio Oil Co. (No par)	200,000	17.292	3,458,394.00	28.75	5,750,000.00
Peoples Gas Light & Coke Co. (Par \$25)	30,800	30.603	942,573.46	36.50	1,124,200.00
Phelps Dodge Corporation Cap. (Par \$12.50)	70,000	26.358	1,845,087.74	38.625	2,703,750.00
Socony Mobil Oil Co. Inc. Cap. (Par \$15)	300,000	25.927	7,778,152.30	47.50	14,250,000.00
Standard Oil Co. of California Cap. (Par \$6.25)	200,000	9.468	1,893,562.39	45.875	9,175,000.00
Standard Oil Co. (Indiana) Cap. (Par \$25)	1,000,000	14.185	14,184,717.71	35.875	35,875,000.00
Standard Oil Co. (New Jersey) Cap. (Par \$7)	6,000,000	5.006	30,037,173.47	49.875	299,250,000.00
Travelers Insurance Co. Cap. (Par \$5)	25,000	34.255	856,385.00	72.00	1,800,000.00
Union Carbide Corporation (No par)	20,000	85.790	1,715,807.93	95.00	1,900,000.00

SCHEDULE OF SECURITIES—*concluded*

STOCKS— <i>concluded</i>	SHARES	LEDGER VALUE		MARKET VALUE	
		PRICE	TOTAL	PRICE	TOTAL
Union Pacific R. R. Co. (Par \$10)	50,000	\$21.513	\$ 1,075,659.68	\$24.50	\$ 1,225,000.00
Union Tank Car Co. Cap. (No par)	111,485	5.931	661,314.05	27.25	3,037,966.25
United Fruit Co. Cap. (No par)	20,000	56.699	1,133,989.79	35.125	702,500.00
United States Steel Corporation (Par \$16-2/3)	20,000	41.115	822,293.22	51.375	1,027,500.00
Westinghouse Electric Corporation (Par \$12.50)	20,000	61.227	1,224,541.52	63.50	1,270,000.00
Weyerhaeuser Timber Co. Cap. (Par \$7.50)	120,000	13.3716	<u>1,604,588.31</u>	31.375	<u>3,765,000.00</u>
			<u>\$106,599,865.18</u>		<u>\$457,758,091.25</u>

## SUMMARY

	LEDGER VALUE	MARKET VALUE
Bonds	\$ 93,862,265.48	\$ 92,668,225.00
Stocks	<u>106,599,865.18</u>	<u>457,758,091.25</u>
	<u>\$200,462,130.66</u>	<u>\$550,426,316.25</u>

**Geographical Distribution  
of Grants, 1957**



# GEOGRAPHICAL DISTRIBUTION OF GRANTS, 1957

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UNIVERSITY OF ALABAMA	
Political philosophy: I. Jenkins; study	9,967    238
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UNIVERSITY OF ARIZONA	
Collaboration with the University of Sonora, Hermosillo, Mexico: development	10,000    169
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M. Rossi-Doria; visiting appointment	5,000 190
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J. S. Coleman; travel and research	7,390 190
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<b>UNIVERSITY OF FLORIDA</b>		
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<b>UNIVERSITY OF HAWAII</b>		
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A. D. Bloom; study	5,475	211
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<b>UNIVERSITY OF KANSAS</b>		
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## MASSACHUSETTS

## AMHERST COLLEGE

## Political philosophy:

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K. Lowenstein; study	4,400	211

## BRANDEIS UNIVERSITY

Economic development: research	17,000	189
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## HARVARD UNIVERSITY

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M. Karpovich; research and writing	12,000	238
W. Z. Laqueur; study	9,000	231
Sociology: study	8,200	190

## INSTITUTE ON RELIGION IN AN AGE OF SCIENCE

Summer conference: expenses of lecturers and participants	3,000	240
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## JACOB'S PILLOW DANCE FESTIVAL, INC.

Scholarship assistance	5,000	249
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## MARINE BIOLOGICAL LABORATORY

Toward construction and equipment of a new building	738,500	117
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## MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Indonesian civilization: field study	14,000	202
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## MICHIGAN

## ASSOCIATION FOR ASIAN STUDIES, INC.

Committee on South Asian Languages: support	15,080	225
Program of advanced training for South Asian linguists: support	72,000	225

## CHILD RESEARCH CENTER OF MICHIGAN

Genetics of sickle cell anemia: research	8,000	125
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## UNIVERSITY OF MICHIGAN

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INSTITUTE FOR ADVANCED STUDY		
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A. Darazs and family; interim support	5,400	255
M. Hontvary and Z. Cserhat (Mrs. Hontvary); interim support	4,400	255
A. Majorossy; interim support	3,100	255
S. Szabo and K. Barcszy (Mrs. Szabo); interim support	4,400	255
AMERICAN NURSES' FOUNDATION, INC.		
Field services for visiting nurses: support	9,000	83
Aid to refugee Hungarian nurses: support	2,500	83
AMERICAN PUBLIC HEALTH ASSOCIATION, INC.		
General support	150,000	95
ASSOCIATION OF AMERICAN UNIVERSITIES		
Expenses in connection with the 1958 meeting of the Association of Universities of the British Commonwealth	10,000	267
BOYCE THOMPSON INSTITUTE FOR PLANT RESEARCH, INC.		
Obligate parasitism: study	45,000	156
X-ray crystallography: B. S. Magdoff; travel	1,500	138
BROADCASTING FOUNDATION OF AMERICA, INC.		
International exchange program: support	12,250	231
BROOKLYN COLLEGE		
Area studies program: preliminary expenses	10,000	267
BROOKLYN MUSEUM		
Book on twentieth-century prints: U. E. Johnson; preparation	10,000	248
CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE		
Bilderberg Group: expenses of American participants	5,000	208
COLUMBIA UNIVERSITY		
Alexander Hamilton papers: preparation of new edition	50,000	235
Biochemistry: research	75,000	125
Genetics: research	37,000	124
Islamic history: I. H. Qureshi; research and writing	7,500	239
Linguistics: Study	1,265	233
U. Weinreich; book preparation	2,375	233
Marine biology: research	300,000	118
Near and Middle East Institute: Z. V. Togan; research	6,000	239
Philosophy of science: E. Nagel; book preparation	9,000	239
United Nations diplomacy: A. W. Rudzinski; research	9,500	208
Zoology: T. Dobzhansky; travel	1,000	174

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COOPER UNION		
Scandinavian Seminar for Cultural Studies: E. S. Burdell; travel	2,000	268
CORNELL UNIVERSITY		
Electron microscopy: G. W. Richter; travel	4,350	197
Medical care and education: G. G. Reader; travel	1,950	90
Plant physiology: research	250,000	149
ELMIRA COLLEGE		
Contemporary Turkish life: M. B. Swearingen; travel and study	10,000	231
FEDERAL RESERVE BANK OF NEW YORK		
Economics: A. I. Bloomfield; travel and research	7,000	190
L. S. HARRISON		
Museum lighting: travel	6,250	248
INSTITUTE OF JUDICIAL ADMINISTRATION, INC.		
General support	150,000	206
JESUIT EDUCATIONAL ASSOCIATION		
E. B. Rooney, S.J.; travel	6,000	267
G. E. JUDD, SR.		
Financing of American symphony orchestras: study	1,200	250
LINCOLN CENTER FOR THE PERFORMING ARTS, INC.		
Development	7,500,000	240
MEDICAL EDUCATION AND PUBLIC HEALTH FIELD SERVICES		
Development of a portable insecticide sprayer	65,000	98
NATIONAL COUNCIL ON COMMUNITY FOUNDATIONS, INC.		
General support	45,000	266
NEW DRAMATISTS COMMITTEE, INC.		
Program for promising playwrights: support	54,000	245
NEW YORK PRO MUSICA ANTIQUA, INC.		
General support	46,000	245
NEW YORK UNIVERSITY—BELLEVUE MEDICAL CENTER		
Rehabilitation: training for Burmese personnel	11,000	82
PARTISAN REVIEW		
Literature: W. Phillips; travel P. Rahv; travel	6,600 3,400	248 248
ROCKEFELLER FOUNDATION HUNGARIAN REFUGEE AID PROGRAM	250,000	262

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<b>SOCIAL SCIENCE RESEARCH COUNCIL</b>		
Committee on Preventive Medicine and Social Science Research: conference	10,000	99
Legal and political philosophy: fellowships	86,250	209
Social trends in the United States: preliminary study	10,000	208
<b>THE ROCKEFELLER INSTITUTE</b>		
Medicine: Dr. and Mrs. W. Trager; travel and research	3,375	109
<b>UNION COLLEGE</b>		
Foreign student orientation: Dr. and Mrs. C. Davidson; travel	4,900	268
<b>UNION THEOLOGICAL SEMINARY</b>		
Religious drama: R. E. Seaver; travel	3,500	249
<b>UNIVERSITY OF THE STATE OF NEW YORK, DEPARTMENT OF EDUCATION</b>		
Inter-institutional cooperation among colleges and universities of the state: exploratory study	200	268
<b>VIRUS STUDIES</b>	380,000	30
<b>YOUNG MEN'S AND YOUNG WOMEN'S HEBREW ASSOCIATIONS</b>		
Poetry Center: development	20,600	247
<b>NORTH CAROLINA</b>		
<b>DUKE UNIVERSITY</b>		
Political philosophy: J. Colton; study	3,700	211
School of Nursing: development of graduate program	238,000	71
<b>UNIVERSITY OF NORTH CAROLINA</b>		
Mathematical and experimental genetics: research	195,000	151
<b>OHIO</b>		
<b>OHIO STATE UNIVERSITY</b>		
Insect acoustics: research	1,000	175
<b>OHIO WESLEYAN UNIVERSITY</b>		
Political science: E. V. Walter; research	6,700	210
<b>PENNSYLVANIA</b>		
<b>BRYN MAWR COLLEGE</b>		
Political science: P. Bachrach; study	4,500	211
G. C. K. Leighton; study	3,500	208
<b>PENNSYLVANIA STATE UNIVERSITY</b>		
Soviet foreign policy: V. V. Aspaturian; research	3,700	208

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UNIVERSITY OF PENNSYLVANIA	
Medical care: K. O. Elsom; travel	1,500     91
UNIVERSITY OF PITTSBURGH	
Hospital administration:	
Dr. and Mrs. J. R. McGibony; travel	5,750     84
Industrial health engineering: T. F. Hatch; travel	1,025     84
Program in radiobiology: development	7,400     99
Program in radiological health: development	500,000     69
PUERTO RICO	
DEPARTMENT OF HEALTH	
Regionalization of medical and public health facilities: development	590,000     93
UNIVERSITY OF PUERTO RICO	
Philosophy: J. Marias; research	17,000     238
Puerto Rico medical center: preliminary studies	75,000     78
Radioisotope techniques training center: establishment	8,000     99
RHODE ISLAND	
BROWN UNIVERSITY	
Babylonian texts: A. J. Sachs; travel and study	3,000     240
English language instruction: W. F. Twaddell; study	8,594     254
TENNESSEE	
OAK RIDGE NATIONAL LABORATORY	
Biochemistry: J. R. Totter; travel	1,100     133
TEXAS	
Baylor University	
Drama: R. Yelvington; appointment as resident playwright	3,000     249
TEXAS AGRICULTURAL AND MECHANICAL COLLEGE SYSTEM	
Training program in rice improvement: support	30,000     162
TEXAS AGRICULTURAL EXPERIMENT STATION	
R. E. Karper; travel	590     175
J. R. Quinby; travel	590     175
UNIVERSITY OF TEXAS	
Ecology: research	10,000     115
English language instruction: training program for Egyptian teachers of English	71,000     252
Legal philosophy: J. P. Witherspoon, Jr.; research	7,750     210
Second International Congress of Mexican-United States Historians: expenses of Latin American participants	6,850     232

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<b>UTAH</b>		
UNIVERSITY OF UTAH		
Enzyme chemistry: research	35,000	128
<b>VERMONT</b>		
MIDDLEBURY COLLEGE		
Russian Summer School: development of new courses	10,000	231
<b>WASHINGTON</b>		
STATE COLLEGE OF WASHINGTON		
Agronomy: equipment	5,000	171
UNIVERSITY OF WASHINGTON		
American studies: G. E. Taylor and L. S. Woodburne; travel	810	234
<b>WEST VIRGINIA</b>		
AMERICAN SYMPHONY ORCHESTRA LEAGUE, INC.		
Program to encourage the performance internationally of contemporary orchestral music: support	9,768	248
WEST VIRGINIA UNIVERSITY		
American legal utilitarianism: G. O. W. Mueller; study	8,500	210
<b>WISCONSIN</b>		
UNIVERSITY OF WISCONSIN		
Biological nitrogen fixation: research	37,500	160
British foreign policy: L. D. Epstein; research	9,450	189
Development of community theatres: R. E. Gard; study	6,000	249
Genetics: research	14,000	124
Medical School: curriculum study	10,000	83
Population genetics: J. F. Crow; travel	2,550	124
<b>NORTH AMERICA</b>		
<b>CANADA</b>		
CANADIAN NURSES' ASSOCIATION, OTTAWA		
Nursing school accreditation: H. K. Mussallem; travel	2,300	89
DEPARTMENT OF PUBLIC HEALTH, PROVINCE OF SASKATCHEWAN, SASKATOON		
Psychiatry: M. J. Callbeck; travel	2,550	89
LAVAL UNIVERSITY, QUEBEC		
French-Canadian folklore: L. Lacourcière; study	1,400	240

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UNIVERSITY OF ALBERTA, EDMONTON		
Nursing: R. E. McClure; travel	1,425	91
UNIVERSITY OF SASKATCHEWAN, SASKATOON		
Schizophrenia: research	78,750	107
UNIVERSITY OF TORONTO		
Survey of general medical practice in Canada: support	115,500	96
MEXICO		
AGRICULTURAL OPERATING PROGRAM	185,165	45
CENTER OF LATIN AMERICAN MONETARY STUDIES, MEXICO CITY		
Training center in national accounts: support	10,000	203
COLEGIO DE MÉXICO, MEXICO CITY		
Contemporary Mexican history: study	18,300	238
Latin American studies:		
Professor and Mrs. D. Coatio V.; travel	9,000	238
Literary studies: support	39,000	236
MEXICAN-AMERICAN CULTURAL INSTITUTE, MEXICO CITY		
English language instruction:		
Production of phonograph records	12,000	254
Survey	8,500	254
MEXICAN INSTITUTE OF NATURAL RENEWABLE RESOURCES, MEXICO CITY		
Arid lands research: support	10,000	169
MINISTRY OF AGRICULTURE, MEXICO CITY		
Agricultural Extension Service:		
J. Zamora L.; travel and study	2,100	173
General Agricultural Division:		
J. Rodriguez G.; travel and study	1,645	174
J. Salazar; travel and study	1,645	174
Office of Special Studies: C. Tapia; travel	1,650	174
NATIONAL INSTITUTE OF ANTHROPOLOGY AND HISTORY, MEXICO CITY		
Art restoration: expenses of visiting expert	1,325	250
NATIONAL SCHOOL OF AGRICULTURE, CHAPINGO		
Botany: C. Prywer; travel	1,300	174
Graduate agricultural education: J. Muñoz V.; travel	610	174
NATIONAL UNIVERSITY OF MEXICO, MEXICO CITY		
Mycology: research expenses	5,000	171
Veterinary science: M. H. Sarvide A.; travel	2,800	171
TECHNOLOGICAL INSTITUTE AND SCHOOL OF ADVANCED STUDIES OF MONTERREY		
School of Agriculture: development	102,000	153

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<b>UNIVERSITY OF CHIHUAHUA</b>	
Department of Physiology: equipment	20,000 81
School of Animal Husbandry: development	40,000 159
<b>UNIVERSITY OF GUADALAJARA</b>	
Faculty of Medicine: equipment	40,000 80
<b>UNIVERSITY OF SAN LUIS POTOSÍ</b>	
Preparatory School: expenses	8,440 115

**CENTRAL AND SOUTH AMERICA**

<b>CORN IMPROVEMENT PROJECT</b>	44,550 45
<b>INTER-AMERICAN SOCIETY OF PLANT BREEDERS, PLANT PATHOLOGISTS, ENTOMOLOGISTS, AND SOIL SCIENTISTS</b>	
Fourth meeting in Chile: expenses	25,000 163
<b>LATIN AMERICAN SCHOLARSHIPS IN AGRICULTURE</b>	200,000 45

**ARGENTINA**

<b>MERCEDES AND MARTÍN FERREYRA INSTITUTE FOR MEDICAL RESEARCH, CÓRDOBA</b>	
Hormone biochemistry: research equipment	3,000 133
<b>UNIVERSITY OF BUENOS AIRES</b>	
Clinical medicine: equipment and research expenses	8,200 115
Enzyme chemistry: research	3,920 132
Institute of General Anatomy and Embryology: research expenses	15,000 137
Institute of Physiology: research expenses	7,000 132

**BOLIVIA**

<b>UNIVERSITY OF SAN SIMÓN, COCHABAMBA</b>	
Plant breeding: equipment and research expenses	10,000 170

**BRAZIL**

<b>BIOLOGICAL INSTITUTE, SÃO PAULO</b>	
Biology: M. P. Autuori; travel	1,450 174
<b>BIOLOGY INSTITUTE OF BAHIA, SALVADOR</b>	
Animal virology: research	28,000 139
<b>BRAZILIAN NURSING ASSOCIATION, RIO DE JANEIRO</b>	
Survey of the status of nursing and nursing education in Brazil: expenses	45,000 80

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CAMPAIGN FOR THE IMPROVEMENT OF HIGHER EDUCATION PERSONNEL, RIO DE JANEIRO	
Medical and nursing education: fellowships	145,000     76
ELISEU MACIEL SCHOOL OF AGRONOMY, PELOTAS	
Laboratory equipment	1,200     174
FACULTY OF MEDICINE AND SURGERY OF PARÁ, BELÉM	
Medical education: J. R. da Silveira, III; travel	2,750     89
FLUMINENSE FACULTY OF MEDICINE, NITERÓI	
Department of Parasitology: equipment and supplies	9,000     83
GETULIO VARGAS FOUNDATION, RIO DE JANEIRO	
Brazilian Institute of Economics:	
Agricultural economics; preliminary study	10,000     203
Library development	800     203
Postgraduate training program; support	80,000     195
INSTITUTE OF BIOLOGY AND TECHNOLOGICAL RESEARCH, CURITIBA	
Experimental biology: research expenses	60,000     112
MEDICAL EDUCATION AND PUBLIC HEALTH FIELD SERVICES	35,900     97
NATIONAL AGRICULTURAL RESEARCH SERVICE, RIO DE JANEIRO	
Institute of Ecology and Agricultural Experimentation: research equipment	3,000     173
PAULISTA SCHOOL OF MEDICINE, SÃO PAULO	
Microbiology: O. G. Bier; travel	1,655     91
Virology: M. B. Esteves; travel and study	2,150     140
RURAL UNIVERSITY OF THE STATE OF MINAS GERAIS, BELO HORIZONTE	
School of Veterinary Medicine: development	200,000     150
SECRETARIAT OF AGRICULTURE, STATE OF SÃO PAULO	
Institute of Agronomy:	
Library equipment and supplies	10,000     169
Library science; E. M. Zink; travel	2,550     169
Institute of Biology: research equipment	10,000     169
UNIVERSITY OF BAHIA	
Physiology: J. A. Novis; travel	2,650     110
UNIVERSITY OF BRAZIL, RIO DE JANEIRO	
Institute of Microbiology:	
H. da S. Castro; travel and study	1,750     117
P. de Goes; travel	2,600     89
UNIVERSITY OF MINAS GERAIS, BELO HORIZONTE	
Cytology and genetics: research	9,000     125

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UNIVERSITY OF PARÁIBA, JOÃO PESSOA		
Department of Histology and Embryology: equipment	6,000	84
UNIVERSITY OF PARANÁ, CURITIBA		
Genetics: research	5,000	125
UNIVERSITY OF RECIFE		
Surgery: E. J. Wanderley, Jr.; travel	1,946	90
UNIVERSITY OF RIO GRANDE DO SUL, PÓRTO ALEGRE		
Scientific research: support	80,000	122
UNIVERSITY OF SÃO PAULO		
<i>Piracicaba:</i>		
Luiz de Queiroz College of Agriculture: development	300,000	148
<i>Ribeirão Preto:</i>		
Biochemistry: F. J. S. Lara; travel	2,000	133
Nursing: G. de Alcantara; travel	2,400	88
Physiology: M. R. Covian; travel	3,000	88
<i>São Paulo:</i>		
Brazilian Institute of Education, Science, and Culture: support of Science Development Program	10,000	115
Electron Microscopy Laboratory: equipment and supplies	2,500	137
Faculty of Philosophy, Sciences, and Letters: research	120,000	110
Histology: L. C. U. Junqueira; travel	1,850	88
Human genetics: research	8,650	125
Plant physiology: M. G. Ferri; travel	5,450	115
Thoracic surgery: E. de J. Zerbini; travel	2,800	88
VIRUS RESEARCH PROGRAM, BELÉM	36,000	30
CHILE		
AGRICULTURAL OPERATING PROGRAM	145,250	45
CATHOLIC UNIVERSITY OF CHILE, SANTIAGO		
Economic Research Center: research and training expenses	19,000	202
Medical education: J. V. Luco; travel	1,000	92
H. DÍAZ-ARRIETA		
Gabriela Mistral manuscripts: preparation for publication	5,850	249
MEDICAL EDUCATION AND PUBLIC HEALTH FIELD SERVICES	3,000	97
MINISTRY OF AGRICULTURE, SANTIAGO		
Library development	55,000	155
Plant science: H. Wulf M.; travel and study	2,865	173

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**UNIVERSITY OF CHILE, SANTIAGO**

Agricultural education:

Rector and Mrs. J. Gomez M.; travel	1,000	175
Graduate School of Economics: development	66,400	193
Historiography: E. Pereira S.; research	6,850	239
History of Chile: A. Jara H. and R. Mellafe R.; study	9,600	239
Institute of Economic Research: research expenses	105,000	193
Marine Biological Station: equipment and supplies	10,000	122

Medicine:

O. Avendano; travel	1,250	90
G. Ducach G.; travel	1,000	90
J. Harnecker; travel	1,950	90
B. Viel; travel	1,600	90
Radiobiology: research	10,000	137

**UNIVERSITY OF CONCEPCIÓN**

Agricultural library at Chillán: development	8,000	170
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**COLOMBIA**

AGRICULTURAL OPERATING PROGRAM	176,250	45
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**NATIONAL UNIVERSITY OF COLOMBIA, BOGOTÁ**

Faculty of Agronomy at Palmira: equipment	11,450	168
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**UNIVERSITY OF THE ANDES, BOGOTÁ**

Cell physiology: research	5,000	115
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**UNIVERSITY OF ANTIOQUIA, MEDELLÍN**

Faculty of Medicine:

E. Bojanini; travel	2,650	89
P. Perez U.; travel	2,650	89
H. Velez; travel	2,600	89

**UNIVERSITY OF CALDAS, MANIZALES**

Faculty of Agronomy: expenses of new facilities	9,000	170
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**UNIVERSITY OF VALLE, CALI**

Biochemistry: A. Colas E.; appointment to faculty	5,000	83
Conference on nutritional deficiencies; expenses	7,200	132
Faculty of Medicine: development	210,000	72
Medicine: Dr. and Mrs. A. Ocampo L.; travel	3,050	83
Obstetrics and gynecology:		
H. J. Tatum; visiting professorship	9,200	83
Physiology: L. M. Borrero; travel and study	2,050	83
University Hospital:		
salary supplement for medical record librarian	5,200	99

**J. VERGARA D.**

Child health and welfare: travel	4,500	85
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**COSTA RICA**

INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES, TURRIALBA

Corn improvement program: support	7,500	168
Horticulture: expenses of cooperative research	13,250	168
Meeting on agricultural higher education: expenses of Latin American participants	5,000	168
Research center for temperate zone agriculture: preliminary study	7,750	168

**ECUADOR**

CENTRAL UNIVERSITY OF ECUADOR, QUITO

Faculties of Agronomy and Veterinary Science: Development	300,000	147
G. Naranjo M.; travel	1,730	174

INTER-AMERICAN COOPERATIVE AGRICULTURAL SERVICE, QUITO

Agriculture: A. Garcia; travel	725	175
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**EL SALVADOR**

UNIVERSITY OF EL SALVADOR, SAN SALVADOR

School of Medicine:		
J. Allwood P.; travel	950	92
Basic sciences; development of teaching program	171,000	75
F. Castillo; travel	700	92
J. J. Fernandez, Jr.; travel	1,050	92
L. E. Vasquez; travel	950	92

**GUATEMALA**

NATIONAL SCHOOL OF AGRICULTURE, BARCENA

Equipment and supplies	10,000	169
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UNIVERSITY OF SAN CARLOS, GUATEMALA CITY

Faculty of Agronomy: equipment and library materials	10,000	169
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**JAMAICA**

UNIVERSITY COLLEGE OF THE WEST INDIES, MONA

Caribbean art festival:		
E. Hill, N. Vaz, and D. Wolcott; travel	2,000	249
Technical assistance	6,030	249
University Hospital:		
V. J. Keating; travel	1,800	91
D. M. Picou; travel	425	91

**PERU**

INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES, ANDEAN

ZONE TRAINING CENTER, LIMA

Irrigation: E. Blair; travel	1,850	168
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MINISTRY OF AGRICULTURE, LIMA	
Bean improvement program: development	5,000 171
UNIVERSITY OF SAN MARCOS, LIMA	
Cell metabolism: M. Villavicencio; research	9,000 132
Faculty of Veterinary Medicine:	
Equipment and research expenses	15,000 164
M. Moro S.; travel	3,600 172
T. Ramos S.; travel	2,780 172
Salary supplements	23,300 164
Physiology: V. E. Fernandez E.; travel	3,750 87

**TRINIDAD**

MINISTRY OF EDUCATION AND CULTURE, GOVERNMENT OF TRINIDAD AND TOBAGO, PORT-OF-SPAIN	
Archival program for Trinidad and Tobago: organization	2,280 255
ROYAL VICTORIA INSTITUTE MUSEUM, PORT-OF-SPAIN	
Biology: A. Greenhall; travel	650 140
VIRUS RESEARCH PROGRAM, PORT-OF-SPAIN	83,760 30

**URUGUAY**

UNIVERSITY OF THE REPUBLIC, MONTEVIDEO	
Obstetrical physiology: research	75,000 111

**EUROPE****AUSTRIA**

MINISTRY OF EDUCATION, VIENNA	
East European studies: R. G. Plaschka; travel	500 234
UNIVERSITY OF VIENNA	
History: F. Fellner and H. Hantsch; travel	6,000 239
Institute for Political Economy: research	3,000 189
Institute of Statistics: research	9,500 189
Physiological Institute: research equipment	3,300 109
Plant cytology: research equipment	3,600 116
Protein chemistry: research equipment	18,000 131

**BELGIUM**

INSTITUTE OF INTERNATIONAL RELATIONS, BRUSSELS	
Economic development: study	6,300 204
UNIVERSITY OF BRUSSELS	
Cytology: A. Ficq; travel	1,650 125

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UNIVERSITY OF LOUVAIN	
Biochemistry: research	15,000 131
Muscle physiology: research	2,100 116
DENMARK	
CARLSBERG FOUNDATION	
Cytophysiology: research equipment and supplies	3,000 116
FOREIGN POLICY SOCIETY OF DENMARK, COPENHAGEN	
Economic balance of power: study	9,700 208
UNIVERSITY OF COPENHAGEN	
Marine Biological Institute: equipment	30,000 121
FINLAND	
UNIVERSITY OF HELSINKI	
Pharmacology and biochemistry: A. V. Vartiainen; travel	3,000 133
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CERNUSCHI MUSEUM, PARIS	
Oriental art: M. David; travel	2,250 233
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Philharmonia Hungarica: support	40,000 252
COUNCIL FOR INTERNATIONAL ORGANIZATIONS OF MEDICAL SCIENCES, PARIS	
Seminar on abnormal hemoglobins: expenses of participants 10,000 131	
ÉCOLE PRATIQUE DES HAUTES ÉTUDES, SIXTH SECTION, PARIS	
Area studies program: development	80,000 228
NATIONAL FOUNDATION OF POLITICAL SCIENCES, PARIS	
Political theory: research and training	81,900 184
PASTEUR INSTITUTE, PARIS	
International symposium on bacteriophage: expenses	6,200 139
UNIVERSITY OF AIX-MARSEILLES	
Marine Station of Endoume: research equipment	5,000 122
UNIVERSITY OF PARIS	
Islamic civilization: Dr. and Mrs. R. Brunschwig; travel	5,500 232
GERMANY	
FREE UNIVERSITY OF BERLIN	
American studies: J. O. McCormick; study	1,300 233
East Europe Institute: conference	3,000 240
Marxism-Leninism: research	31,700 234

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UNIVERSITY OF HEIDELBERG		
Biochemistry: F. Cramer; research		10,000 131
UNIVERSITY OF THE SAAR, SAARBRÜCKEN		
Physiology: R. Staempfli; travel		800 110
GREECE		
STATE-SCHOLARSHIPS FOUNDATION, ATHENS		
University education: C. Th. Dimaras; travel		3,150 212
IRELAND		
UNIVERSITY COLLEGE, DUBLIN		
Biochemistry: research		12,000 130
ITALY		
COLLEGE OF HIGHER EDUCATION, PISA		
American philosophy:		
M. Corsi; travel		1,078 240
Library development		1,000 240
UNIVERSITY INSTITUTE OF VENICE		
Economic history: research and library development		9,520 189
UNIVERSITY OF CAMERINO		
Biological chemistry: research equipment and supplies		5,000 132
Experimental zoology: research equipment and supplies		4,000 116
UNIVERSITY OF FLORENCE		
Political science: research		12,300 188
UNIVERSITY OF MILAN		
Jurisprudence: U. Scarpelli; research		3,000 190
UNIVERSITY OF PALERMO		
Experimental embryology and physiology: research		30,000 113
Institute of Comparative Anatomy: E. Nakano; research		2,225 116
UNIVERSITY OF PARMA		
Institute of Pharmacology: research		18,000 131
UNIVERSITY OF PAVIA		
Cytochemistry: research equipment		3,500 132
Genetics Center: research equipment and expenses		3,500 172
Genetics of the housefly: research		7,425 125
UNIVERSITY OF SIENA		
Institute of Statistics: equipment		205 191

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Biostatistics: J. R. Sievers; travel and study	3,400	87
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Political science: N. Stjernquist; travel	4,250	212
<b>UNIVERSITY OF UPPSALA</b>		
Institute of Physiological Botany: research equipment	6,000	115
Medical education: B. Vahlquist; travel	950	92
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<b>SWITZERLAND</b>		
<b>FEDERAL TECHNICAL INSTITUTE, ZURICH</b>		
Biochemistry: research equipment	33,000	129
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Fiscal economics: A. R. Prest; travel	3,500	212
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Psychology: L. Weiskrantz; travel	2,440	110
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Institute of Animal Genetics: research equipment	8,500	125
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Plant breeding: H. C. Thorpe; travel	225	175
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R. M. Smock; visiting professorship	7,200	170
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University education: S. Mathai; travel	4,230	255
<b>UNIVERSITY OF BARODA</b>		
University publishing in India: R. J. Patel; survey	1,100	255
<b>UNIVERSITY OF CALCUTTA</b>		
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<b>UNIVERSITY OF DELHI</b>		
Philosophy: A. S. Ayyub; research	1,325	240
<b>UNIVERSITY OF LUCKNOW</b>		
King George's Medical College: A. D. Engincer; travel	3,800	86
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SUNTHORN S.		
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Biochemistry: I. Yamashina; travel	900	134
KEIO UNIVERSITY, TOKYO		
Medical education: T. Iwahara; travel	3,925	86
Pathology: T. Kobayashi; travel	3,850	86
Physiology: research	6,500	109
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Anesthesiology: A. Inamoto; travel	3,875	86
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<b>NAGOYA NATIONAL UNIVERSITY</b>		
Biochemistry: K. Yagi; travel	1,800	133
International economics: K. Kitagawa; travel and study	600	212
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Faculty of Agriculture: research equipment	14,500	167
Ohara Institute for Agricultural Biology: research	15,000	167
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Institute of Social and Economic Research: support	37,700	200
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